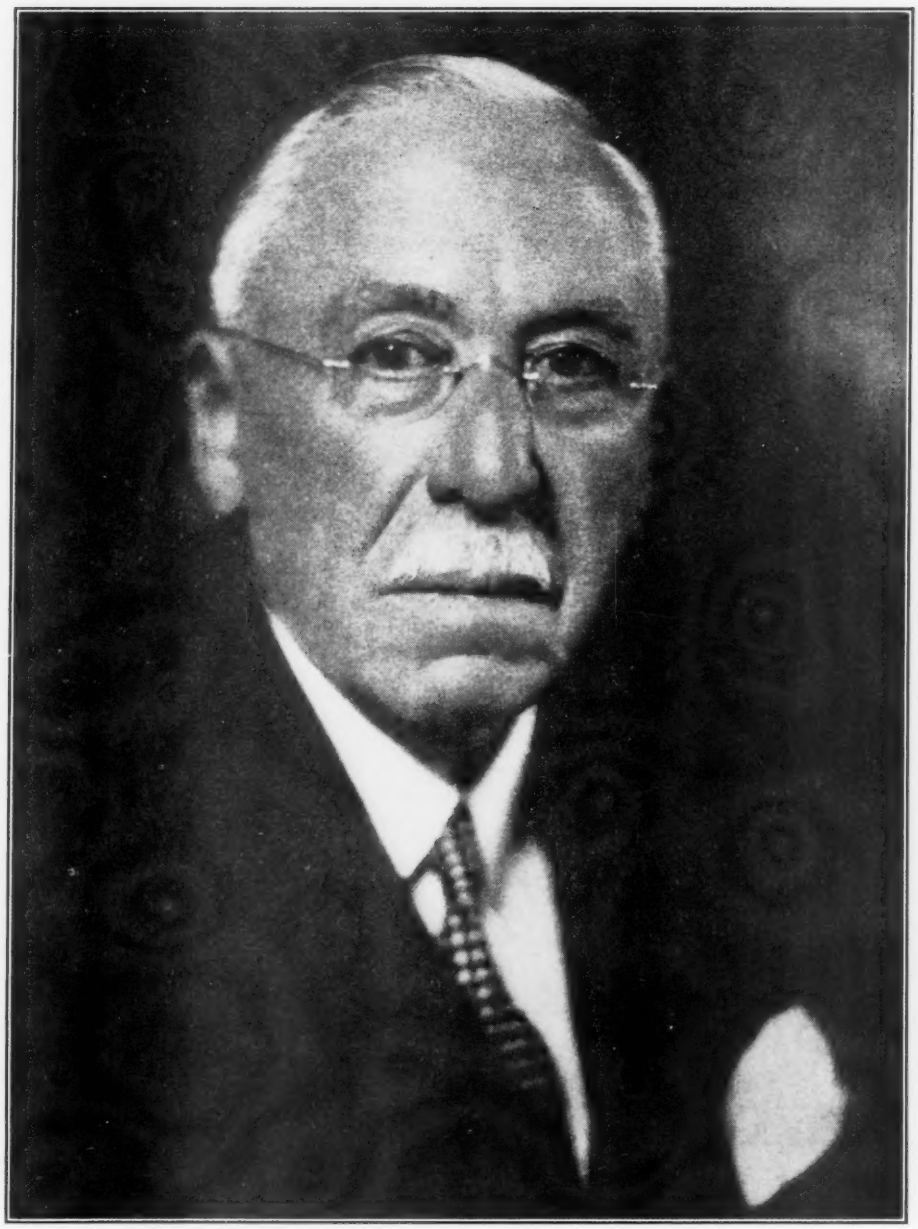
THE BULLETIN

OF THE

AMERICAN CERAMIC SOCIETY

Volume 17 JUNE 1938 Number 6



Charles L. Allen

See page 266 for story of Charles L. Allen

Twice a year this Scandinavian ship leaves Greenland with its valuable cargo

Kryolith

THE NATURAL GREENLAND CRYOLITE

THE ROCKS of Greenland give up their mineral treasure unwillingly. Beneath ice and snow, and the northern lights, Nature seems to have locked her prizes away with special care.

Perhaps she knew that some of them —such as the natural Greenland cryolite—are too important to be squandered lavishly. For this is the product that is known to the ceramic industry as Kryolith—the fluoride flux and opacifier which means so much to fine American glass and enamel ware.

It is the genuine natural material, its elements combined by Nature as a stable double fluoride, without the presence of combined moisture. Among its many advantages are the economies it offers in the manufacture of ceramic products. Be sure the frit you buy is made with the natural Greenland product—Kryolith.

PENNSYLVANIA SALT MFG. CO. · Est. 1850
Widener Bldg., Philadelphia, Pa.
New York · Chicago St. Louis · Pittsburgh
Tacoma · Wyandotte

PENNSYLVANIA SALT

THE BULLETIN OF THE AMERICAN CERAMIC SOCIETY

Volume 17 **June, 1938** **Number 6**

CONTENTS

Papers

Uniform Classification of Ceramic Plastic Clays—Otakar Kallauner ... 251
A Sensitive Hydrometer for Determining Small Amounts of Clay or Colloids in Soils—G. J. Bouyoucos ... 254
An Unusual Application of Automatic Spraying of Vitreous Enamel Slip—W. G. Martin ... 255
The Origin, Development, and Present Status of Newcomb Pottery—K. E. Smith ... 257
Salt Domes and Their Ceramic Deposits—R. A. Steinmayer ... 260
The Texas Ceramic Industry—E. P. Schoch and David McKnight, Jr ... 262

Communications—Ceramic History

Charles L. Allen ... 266

Activities of the Society

Association of Ceramic Educators: Minutes of Meeting ... 267
Ceramic Educational Council: Committee Appointments ... 268
Institute of Ceramic Engineers: Officers for 1938–1939 ... 268
Application Blanks Available—Committee Appointments ... 269
Fellows, American Ceramic Society: Committee Appointments ... 269
Honorary Member: Charles W. Thomas ... 270
Czechslovak Ceramic Society Congratulations ... 270
Membership Record to May 19, 1938 ... 271
New Members—Roster Changes ... 272
Industrial Divisions
Glass Division Fall Meeting ... 272
Refractories Division Fall Meeting ... 273
Art Division: Proposal of R. H. Pass ... 273
Local Sections: Pittsburgh—Northern California ... 273
Southern California—Central Ohio (Ortons Honored at Rites Beside Monument)—Michigan-Northwestern Ohio ... 274
Ceramic School Notes: Universities Announce Advanced Degrees, 1938—Ohio State University—University of Washington—Rutgers University—University of Illinois—Massachusetts Institute of Technology ... 275
Ohio State University: Meetings of Ceramic Art Students and Ceramic Engineers Student Branch ... 275
University of Illinois: Clay Product Plant Operators' Conference ... 275
Georgia Tech Gets Charter ... 276
Letters to the Editor: Frederick Carder—Mary Louise McLaughlin ... 276
Necrology: W. K. Brownlee—T. N. Kurtz—A. H. Beeman ... 277
J. W. Mellor ... 278

Notes and News for Ceramists

New York World's Fair, 1939: Ceramic Industry Plans ... 283
Central District Enamelers' Club—Glass Industry Reviewed by W. E. S. Turner—Review of Engineering Education—American Foundrymen's Association Exhaust Code ... 284
H. M. Williams, President, American Society of Refrigeration Engineers—Salute to Enamel Division: Photo, F. R. Porter ... 285
Business *vs.* Government Costs ... 286

Advertisers' Index ... 6

Buyers' Guide ... 9–12

Publication Office: 20th & Northampton Sts., Easton, Pa.
Editorial and Advertising Office: 2525 N. High St., Columbus, Ohio.
Executive Office: 2525 N. High St., Columbus, Ohio.
Committee on Publications: J. D. SULLIVAN, *Chairman;* E. E. MARBAKER, E. DE F. CURTIS, W. W. WINSHIP, ROSS C. PURDY.

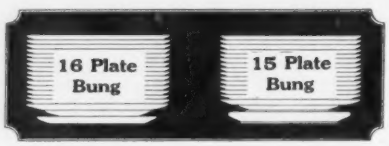
Entered as second-class matter at the post office at Easton, Pa., under the act of March 3, 1879. Published monthly.
Subscription $1.50 a year. Single numbers twenty-five cents
(*Foreign and Canadian postage, 50¢ additional on subscriptions*)
(*Copyright 1938, American Ceramic Society, Inc.*)

360 doz.

MORE PLATES PER DAY

That's just an example of what LOUTHAN Hi-Fire Setters are doing for one dinnerware producer. Same kiln . . . same cars . . . same speed . . . same ware . . . yet a net saving in unit firing cost of over 6%. In this instance, one plate was added in each bung because LOUTHAN Hi-Fire Setters are low and compact.

However, that doesn't mean LOUTHAN Setters are fragile. On the contrary, they are hard in structure and mechanically sturdy. They will withstand all of the usual kiln-room abuse and more. They provide a clean smooth placing surface. They have practical utilization in the green room, as well . . . thus precluding warped ware resulting from bad boards. Remember, a LOUTHAN Setter is hardfired just for dinnerware placing . . . that means no warping, even in continued use. This special refractory body is resistant to thermal shock . . . therefore no dunting. LOUTHAN Hi-Fire Setters are precision made . . . straight and true. They are true when you get them . . . and stay true. They offer unlimited life in regular service . . . and on that basis plus their preservation of quality in production, LOUTHAN Setters are priced extremely low by any comparison. Made in all common sizes. Special sizes and shapes made to order. Details and prices upon request.



LOUTHAN Setter permits adding one plate per bung . . . yet same headroom.

TILE Setter Pins of "Kirox" are but another LOUTHAN specialty for salvaging wasted profit in the kiln room. Cored type . . . hard, smooth and straight. Suitable for either "reared" or "racked" placing . . . and for either one or two fire production. Made in all common sizes and lengths.

DINNERWARE SETTERS
•
TILE SETTER PINS
•
DECORATING THIMBLES
•
FIRING RACKS
•
PINS, STILTS, SPURS, PROPS, etc.

LOUTHAN

• REFRACTORIES •

The LOUTHAN MANUFACTURING COMPANY

Ceramic Specialists

EAST LIVERPOOL, OHIO, U. S. A.

Lancaster

Let Users of the Lancaster Mixer *in the* Abrasive Industry *tell you how good it is*

Note the counter-current action set up by the clockwise rotation of the pan and the counter-clockwise rotation of the mixing star equipment.

"We have found your Lancaster Mixer satisfactory for batch mixing of plastic and semi-plastic materials."

"Your Lancaster Mixer continues to operate satisfactorily. We have no trouble with an accumulation of binder or powdered bakelite on the pan and mixing plows, and find that cleaning is a simple matter."

"We are using the Lancaster Mixer for mixing material for our pressed wheels, and when business increases will install another one."

"We are well pleased with our Lancaster Mixer. It is efficient and very well built."

"Many more testimonial letters can be sent to you on request"

Learn all you can about your product . . . take an active interest in your Trade Association

LANCASTER IRON WORKS, INC.
BRICK MACHINERY DIVISION
LANCASTER, PENNA., U. S. A.

Lancaster

Let Users of the Lancaster Mixer *in the* Glass Industry *tell you* *how good it is*

The central discharge valve fully opened. Note the entire absence of any working parts in the path of the discharged batch.

"Our Lancaster Mixer has performed satisfactorily and we are very well pleased with it."

"The Lancaster Mixer does an excellent mixing job for us. We are also well pleased with the dustless features, and think you have done an excellent job in their design."

"We are very much pleased with the Lancaster Mixer, and believe it gives the best mixture of anything we have ever tried."

"We feel that the Lancaster Mixer delivers a more intimate mixture and with less dust than any mixer on the market."

"In solving your mixing problems we can also help you solve your dust problem"

LANCASTER IRON WORKS, INC.
BRICK MACHINERY DIVISION
LANCASTER, PENNA., U. S. A.

Lancaster

The central discharge valve in closed position. This discharge valve is equal to one-third the diameter of the pan, proportionate in size for each respective unit.

Let Users of the Lancaster Mixer *in the* Ceramic *and* Refractory Industries *tell you* *how good it is*

"The Lancaster Mixer has now been in service for over a year and seems to be much superior to any other type of mixer for our ceramic bodies. It mixes rapidly, thoroughly, and with a minimum amount of power."

"The materials for our ceramic bodies have proven to be very well mixed and of uniform moisture content."

"We have two Lancaster Mixers, developing our light and heavy refractory mixes, giving entire satisfaction. They are unusually well made machines that operate with little attention for maintenance. We have had much experience with various dry and wet pans, as well as batch mixers, which have their place, but do not give certain results that we obtain from our Lancaster."

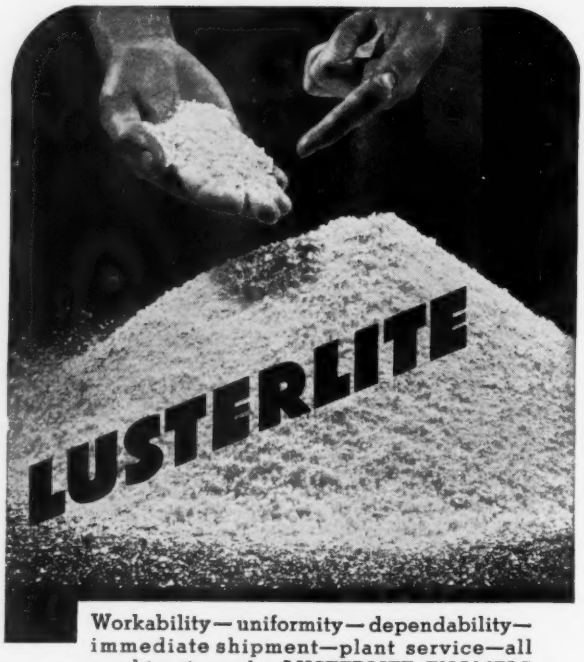
"The Lancaster Mixer gives better results in mixing our refractory material than other machines we have used, inasmuch as the various ingredients put into the machine are more thoroughly mixed."

"Can we also help you? Wire—Write—or Phone"

LANCASTER IRON WORKS, INC.
BRICK MACHINERY DIVISION
LANCASTER, PENNA., U. S. A.

ALPHABETICAL LIST OF ADVERTISERS

	Page
American Potash & Chemical Corporation	21
American Rolling Mill Co.	7
Bethlehem Steel Company	20
Buyers' Guide	9–12
Carborundum Co.	13
Ceramic Color & Chemical Mfg. Company	16
Chicago Vitreous Enamel Product Company	6
Corhart Refractories Company	14
DeVilbiss Co.	17
Du Pont de Nemours, E. I., & Company	23
Edward Orton, Jr., Ceramic Foundation	16
Foote Mineral Co.	17
Frazier-Simplex, Inc.	15
Hammill & Gillespie, Inc.	17
Harshaw Chemical Co.	8
Hartford-Empire Company	19
Hommel, O., Company	22
Kentucky Clay Mining Co.	18
Lancaster Iron Works, Inc.	3–4–5
Louthan Mfg. Co.	2
McDanel Refractory Porcelain Company	18
Metakloth Company	6
Metal & Thermit Corporation	Outside Back Cover
Orton, Edward, Jr., Ceramic Foundation	16
Pacific Coast Borax Company	18
Paper Makers Importing Company	21
Pennsylvania Salt Mfg. Co.	Inside Front Cover
Porcelain Enamel & Mfg. Company	20
Potters Supply Company	22
Professional Directory	20
Proctor & Schwartz, Inc.	20
Ransome Concrete Machinery Co.	17
Sauereisen Cements Co.	19
Solvay Sales Corporation	22
Spinks, H. C., Clay Company	Inside Back Cover
Swindell-Dressler Corp.	18
United Clay Mines Corp.	21
Vitro Mfg. Company	19
Willson Products, Inc.	17
Wilson, H. W., Company	20
Wyodak Chemical Co.	21



Workability—uniformity—dependability—immediate shipment—plant service—all combine to make LUSTERLITE ENAMELS the preferred raw material. For assured quality in your finished product, specify LUSTERLITE ENAMELS.

Chicago Vitreous Enamel Product Co.
1411 SOUTH 55th COURT • CICERO, ILLINOIS

FOR CLAY FILTRATION
use

METAKLOTH
(green)

Silvakloth
(black)

The oldest and best cupra-ammonium finishes for

POTTERY FILTER FABRICS.

These finishes give the fabric a smooth, lustrous, metallic surface—no fibres to catch and break the clay cake as it comes away in one perfect piece—filters better and faster than untreated cloths—requires fewer washings and is easier to keep clean—more continuous operation of your press—lower labor costs and a larger and better product with the same machinery.

The fabric is mildew proofed—pre-shrunk—has an increased tensile strength—has a longer useful life.

This means larger profits for you.

Consult your bag manufacturer or write to,

Metakloth Company, Lodi, N. J.

LET US TELL YOU A TRIANGLE STORY

Not the "eternal triangle" of the fiction-writer, this time. But a story that's true—and far more interesting to you than any product of the imagination.

The first chapter is laid amid the noise and heat of the rolling mill. Its theme is quality—the ceaseless struggle of production men and metallurgists to produce the finest possible enameling iron.

The scene shifts to your plant, where your production-staff finds that the quality of Armco Enameling Iron—its uniformity, ease of drawing, and strong bonding—helps them do their best work.

The last chapter is called "Sales," and is written in the dollars and cents of your profits. For the public has learned that the Armco triangle on a piece of porcelain-enameled ware is a trustworthy guide to the lasting beauty of the article that bears it.

Our people are always ready to help you with any problem of fabrication, enameling, or merchandising. Shall we tell you more of this story of quality and profit? The American Rolling Mill Company; Executive Offices, 730 Curtis Street, Middletown, Ohio.

ARMCO **ARMCO Enameling Iron** *THE WORLD'S STANDARD*

COMPETITION!

Vivid and exotic foreign ware—translucent coloring of plastic compositions—brilliant, bizarre, metal and lacquer finishes, compete with ceramics on today's market . . . . . To meet this challenge, the American ceramic industry must concentrate on: attractive design, appealing decoration, color, and improved finishes. Constant research in the Harshaw laboratories has produced a wider range of colors and improved ceramic chemicals and application methods. Every advance in ceramic research makes it easier to meet competition . . . . . Write today for information on:

U V E R I T E
A trouble free opacifier for porcelain enamel.

BODY STAINS
In buff, yellow, salmon, pink and blue.

GLAZE STAINS
In all shades—vivid and pastel.

GLASS ENAMELS
For all types of decoration.

THE HARSHAW CHEMICAL CO.

Manufacturers, Importers, Merchants
Offices and Laboratories: Cleveland, Ohio

Quality products since 1892

New York, Philadelphia, Chicago, Detroit, Pittsburgh, Cincinnati, East Liverpool, Los Angeles, San Francisco
Works at Cleveland and Elyria, Ohio, and Philadelphia, Pa.

Abrasives
Carborundum Co. (*Carborundum and Aloxite*)
Chicago Vitreous Enamel Products Co.
The Hommel Co., O., Inc.
Norton Co. (*Alundum-Crystolon*)

Air Conditioning Systems
Frazier-Simplex, Inc.

Aloxite (Refractory Products)
Carborundum Co.

Alumina (Hydrate and Calcined)
Ceramic Color & Chemical Mfg. Co.
Drakenfeld, B. F., & Co.
Du Pont de Nemours, E. I., & Co., Inc., R. & H. Chemicals Dept.
Harshaw Chemical Co.
The Hommel Co., O., Inc.
The Vitro Mfg. Co.

Alumina (Fused) Brick and Tile
Electro Refractories & Alloys Corp.
Pennsylvania Salt Mfg. Co.
The Vitro Mfg. Co.

Aluminum Oxide (Calcine)
The Hommel Co., O., Inc.
Pennsylvania Salt Mfg. Co.
The Vitro Mfg. Co.

Aluminum Oxide (Fused)
Carborundum Co.
Electro Refractories & Alloys Corp.
Harshaw Chemical Co.
Norton Co.
The Vitro Mfg. Co.

Alundum (Refractory Products)
Norton Co.

Ammonium Bicarbonate
Du Pont de Nemours, E. I., & Co., Inc., R. & H. Chemicals Dept.
Solvay Sales Corp.

Ammonium Bifluoride
Drakenfeld, B. F., & Co.
Du Pont de Nemours, E. I., & Co., Inc., R. & H. Chemicals Dept.
Harshaw Chemical Co.
The Hommel Co., O., Inc.
The Vitro Mfg. Co.

Ammonium Carbonate
Ceramic Color & Chemical Mfg. Co.
Drakenfeld, B. F., & Co.
Du Pont de Nemours, E. I., & Co., Inc., R. & H. Chemicals Dept.
Harshaw Chemical Co.
The Hommel Co., O., Inc.
The Vitro Mfg. Co.

Antimony Oxide
Ceramic Color & Chemical Mfg. Co.
Drakenfeld, B. F., & Co.
Du Pont de Nemours, E. I., & Co., Inc., R. & H. Chemicals Dept.
Harshaw Chemical Co.
The Hommel Co., O., Inc.
The Vitro Mfg. Co.

Antimony Sulphide
Foote Mineral Co.

Arches (Interlocking, Suspending, and Circular)
Frazier-Simplex, Inc.

Arsenic
Harshaw Chemical Co.

Automatic Brick Car Loaders
Lancaster Iron Works, Inc.

Ball Mills
Ceramic Color & Chemical Mfg. Co.
Chicago Vitreous Enamel Product Co.
Hardinge Company, Inc.
The Hommel Co., O., Inc.
McDanel Refractory Porcelain Co.
The Vitro Mfg. Co.

Ball Mills (Laboratory Type)
Ceramic Color & Chemical Mfg. Co.
Chicago Vitreous Enamel Product Co.
Denver Fire Clay Co.
Hardinge Company, Inc.
The Hommel Co., O., Inc.
The Vitro Mfg. Co.

Barium Carbonate
Ceramic Color & Chemical Mfg. Co.
Drakenfeld, B. F., & Co.
Du Pont de Nemours, E. I., & Co., Inc., R. & H. Chemicals Dept.
Foote Mineral Co.
Hammill & Gillespie, Inc.
Harshaw Chemical Co.
The Hommel Co., O., Inc.
The Vitro Mfg. Co.

Batch Systems
Frazier-Simplex, Inc
Lancaster Iron Works, Inc.

Batts
Carborundum Co. (*"Carbofrax Aloxite"*)
Denver Fire Clay Co.
Electro Refractories & Alloys Corp.
Norton Co. (*Alundum-Crystolon*)

Beryl
Foote Mineral Co.

Bichromate of Soda
Harshaw Chemical Co.

Bitstone
Potters Supply Co.

Blocks (Refractory)
Carborundum Co.
Chicago Vitreous Enamel Product Co.
Corhart Refractories Co.
Denver Fire Clay Co.
Electro Refractories & Alloys Corp.
Louthan Mfg. Co.
Norton Co.
The Vitro Mfg. Co.

Body Stains
Du Pont de Nemours, E. I., & Co., Inc., R. & H. Chemicals Dept.

Bone Ash
Harshaw Chemical Co.

Borax
American Potash & Chemical Co.
Denver Fire Clay Co.
Drakenfeld, B. F., & Co.
Du Pont de Nemours, E. I., & Co., Inc., R. & H. Chemicals Dept.
Harshaw Chemical Co.
The Hommel Co., O., Inc.
Pacific Coast Borax Co.
The Vitro Mfg. Co.

Borax Glass
American Potash and Chemical Corp.
Ceramic Color & Chemical Mfg. Co.
Denver Fire Clay Co.
Drakenfeld, B. F., & Co.
Du Pont de Nemours, E. I., & Co., Inc., R. & H. Chemicals Dept.
Harshaw Chemical Co.
The Hommel Co., O., Inc.
Pacific Coast Borax Co.
The Vitro Mfg. Co.

Boric Acid (Anhydrous)
Denver Fire Clay Co.
Drakenfeld, B. F., & Co.
Harshaw Chemical Co.
The Hommel Co., O., Inc.
Pacific Coast Borax Co.
The Vitro Mfg. Co.

Boric Acid (Crystal, Granular, or Powder)
American Potash & Chemical Corp.
Ceramic Color & Chemical Mfg. Co.
Denver Fire Clay Co.
Drakenfeld, B. F., & Co.
Harshaw Chemical Co.
The Hommel Co., O., Inc.
Pacific Coast Borax Co.
The Vitro Mfg. Co.

Boron Carbide
Norton Co.

Brick Machines (also Barrows, Molds)
Lancaster Iron Works, Inc.

Brick (Refractory)
Carborundum Co. (*"Carbofrax Aloxite"*)
Chicago Vitreous Enamel Product Co.
Corhart Refractories Co.
Denver Fire Clay Co.
Electro Refractories & Alloys Corp.
Norton Co.
The Vitro Mfg. Co.

Cadmium Sulphide
Harshaw Chemical Co.

Carbofrax (Refractory Products)
Carborundum Co.

Carbonates (Barium, Lead)
Ceramic Color & Chemical Mfg. Co.
Drakenfeld, B. F., & Co.
Du Pont de Nemours, E. I., & Co., Inc., R. & H. Chemicals Dept.
Harshaw Chemical Co.
The Hommel Co., O., Inc.
The Vitro Mfg. Co.

Castings
Lancaster Iron Works, Inc.

Castings (Abrasive Resisting)
Bethlehem Steel Co.

Caustic Potash
Du Pont de Nemours, E. I., & Co., Inc., R. & H. Chemicals Dept.
Harshaw Chemical Co.
Solvay Sales Corp.

Caustic Soda
Ceramic Color & Chemical Mfg. Co.
Denver Fire Clay Co.
Du Pont de Nemours, E. I., & Co., Inc., R. & H. Chemicals Dept.
Harshaw Chemical Co.
The Hommel Co., O., Inc.
Pennsylvania Salt Mfg. Co.
Solvay Sales Corp.
The Vitro Mfg. Co.

Cements
Carborundum Co.
Chicago Vitreous Enamel Product Co.
Corhart Refractories Co.
Electro Refractories & Alloys Corp.
Norton Co.
Pennsylvania Salt Mfg. Co.

Ceramic Chemicals
Ceramic Color & Chemical Mfg. Co
Drakenfeld, B. F., & Co.
Du Pont de Nemours, E. I., & Co., Inc., R. & H. Chemicals Dept.
Harshaw Chemical Co.
The Hommel Co., O., Inc.
Metal & Thermit Corp.
Pennsylvania Salt Mfg. Co.
The Porcelain Enamel and Mfg. Co.
Titanium Alloy Mfg. Co.
The Vitro Mfg. Co.

Cerium Oxide
Foote Mineral Co.

Chromite (Natural Chromate of Iron)
Foote Mineral Co.

Chromium Oxide
Ceramic Color & Chemical Mfg. Co.
Chicago Vitreous Enamel Product Co.
Drakenfeld, B. F., & Co.
Du Pont de Nemours, E. I., & Co., Inc., R. & H. Chemicals Dept.
Harshaw Chemical Co.
The Hommel Co., O., Inc.
The Vitro Mfg. Co.

Clay (Ball)
Ceramic Color & Chemical Mfg. Co.
Du Pont de Nemours, E. I., & Co., Inc., R. & H. Chemicals Dept.
Hammill & Gillespie, Inc.
Harshaw Chemical Co.
The Hommel Co., O., Inc.
Kentucky Clay Mining Co.
Paper Makers Importing Co.
Potters Supply Co.
Spinks, H. C., Clay Co.
The Vitro Mfg. Co.
United Clay Mines Corp.

Clay (Block)
Du Pont de Nemours, E. I., & Co., Inc., R. & H. Chemicals Dept.

Clay (China)
Ceramic Color & Chemical Mfg. Co.
Edgar Brothers Co.
Edgar Plastic Kaolin Co.
Hammill & Gillespie, Inc.
Harshaw Chemical Co.
The Hommel Co., O., Inc.
Paper Makers Importing Co.
The Vitro Mfg. Co.
United Clay Mines Corp.

Clay—Cleaners, Feeders
Lancaster Iron Works, Inc.

Clay (Electrical, Porcelain)
Ceramic Color & Chemical Mfg. Co.
Edgar Brothers Co.
Edgar Plastic Kaolin Co.
Hammill & Gillespie, Inc.
The Hommel Co., O., Inc.
Kentucky Clay Mining Co.
Paper Makers Importing Co.
Spinks, H. C., Clay Co.
United Clay Mines Corp.

Clay (Enamel)
Ceramic Color & Chemical Mfg. Co.
Chicago Vitreous Enamel Product Co.
Du Pont de Nemours, E. I., & Co., Inc., R. & H. Chemicals Dept.
Edgar Brothers Co.
Edgar Plastic Kaolin Co.
Hammill & Gillespie, Inc.
Harshaw Chemical Co.
The Hommel Co., O., Inc.
Kentucky Clay Mining Co.
Metal & Thermit Corp.
Paper Makers Importing Co.
The Porcelain Enamel & Mfg. Co.
Spinks, H. C., Clay Co.
Titanium Alloy Mfg. Co.
The Vitro Mfg. Co.
United Clay Mines Corp.

Clay (Fire)
Denver Fire Clay Co.
Edgar Brothers Co.
Edgar Plastic Kaolin Co.
Paper Makers Importing Co.
Potters Supply Co.

Clay (German Vallendar)
Ceramic Color & Chemical Mfg. Co.
Chicago Vitreous Enamel Product Co.
Du Pont de Nemours, E. I., & Co., Inc., R. & H. Chemicals Dept.

Hammill & Gillespie, Inc.
Harshaw Chemical Co.
The Hommel Co., O., Inc.
Kentucky Clay Mining Co.
The Porcelain Enamel & Mfg. Co.
The Vitro Mfg. Co.
United Clay Mines Corp.

Clay Miners
Edgar Brothers Co.
Edgar Plastic Kaolin Co.
Paper Makers Importing Co.
Spinks, H. C., Clay Co.
United Clay Mines Corp.

Clay (Potters)
Denver Fire Clay Co.
Edgar Brothers Co.
Edgar Plastic Kaolin Co.
Hammill & Gillespie, Inc.
The Hommel Co., O., Inc.
Kentucky Clay Mining Co.
Paper Makers Importing Co.
Spinks, H. C., Clay Co.
United Clay Mines Corp.

Clay (Process Equipment)
Hardinge Company, Inc.
Lancaster Iron Works, Inc.

Clay (Sagger)
Edgar Brothers Co.
Edgar Plastic Kaolin Co.
The Hommel Co., O., Inc.
Kentucky Clay Mining Co.
Paper Makers Importing Co.
Potters Supply Co.
Spinks, H. C., Clay Co.
United Clay Mines Corp.

Clay (Wad)
Kentucky Clay Mining Co.
Potters Supply Co.
Spinks, H. C., Clay Co.
United Clay Mines Corp.

Clay (Wall Tile)
Edgar Brothers Co.
Edgar Plastic Kaolin Co.
Hammill & Gillespie, Inc.
Kentucky Clay Mining Co.
Paper Makers Importing Co.
Spinks H. C., Clay Co.
United Clay Mines Corp.

Cleaners
Pennsylvania Salt Mfg. Co.
The Porcelain Enamel and Mfg. Co.

Cleaners, Chemical
Harshaw Chemical Co.
Pennsylvania Salt Mfg. Co.

Clocks (Gauge Board)
Chicago Vitreous Enamel Product Co.
The Hommel Co., O., Inc.

Cobalt Oxide
Ceramic Color & Chemical Mfg. Co.
Drakenfeld, B. F., & Co.,
Du Pont de Nemours, E. I., & Co., Inc., R. & H. Chemicals Dept.
Harshaw Chemical Co.
The Hommel Co., O., Inc.
The Porcelain Enamel and Mfg. Co.
The Vitro Mfg. Co.

Cobalt Sulphate
Harshaw Chemical Co.

Colors
Ceramic Color & Chemical Mfg. Co.
Chicago Vitreous Enamel Product Co.
Drakenfeld, B. F., & Co.
Du Pont de Nemours, E. I., & Co., Inc., R. & H. Chemicals Dept.
Harshaw Chemical Co.
The Hommel Co., O., Inc.
The Porcelain Enamel and Mfg. Co.
The Vitro Mfg. Co.

Cones
The Edward Orton, Jr., Ceramic Foundation

Conveying Equipment
Frazier-Simplex, Inc.
Lancaster Iron Works, Inc.

Copper Oxide
Harshaw Chemical Co.

Corhart
Corhart Refractories Co.

Cornwall Stone (Imported)
Drakenfeld, B. F., & Co.
Du Pont de Nemours, E. I., & Co., Inc., R. & H. Chemicals Dept.
Hammill & Gillespie, Inc.
Harshaw Chemical Co.
The Hommel Co., O., Inc.
Paper Makers Importing Co.

Crucibles (Filter, Melting, Ignition)
Carborundum Co.
Denver Fire Clay Co.
Norton Co.
Potters Supply Co.

Crushers (Clay)
Lancaster Iron Works, Inc.

Cryolite (see Kryolith)
Ceramic Color & Chemical Mfg. Co.
Du Pont de Nemours, E. I., & Co., Inc., R. & H. Chemicals Dept.
Harshaw Chemical Co
The Hommel Co., O., Inc.
Pennsylvania Salt Mfg. Co.
The Vitro Mfg. Co.

Crystolon (Refractory Products)
Norton Co.

Cullet, Washing Plants, Incinerators, Crushers
Frazier-Simplex, Inc

Decorating Supplies
Ceramic Color & Chemical Mfg. Co.
Chicago Vitreous Enamel Product Co.
Drakenfeld, B. F., & Co.
Du Pont de Nemours, E. I., & Co., Inc., R. & H. Chemicals Dept.
Harshaw Chemical Co.
The Hommel Co., O., Inc.
The Vitro Mfg. Co.

Disintegrators
Hardinge Company, Inc.
Lancaster Iron Works, Inc.

Dryer (Pipe Rack)
Lancaster Iron Works, Inc.

Drying Machinery
Frazier-Simplex, Inc.
Hardinge Company, Inc.
Lancaster Iron Works, Inc.
Proctor & Schwartz, Inc.

Electrocast Refractories
Corhart Refractories Co.

Enameling Equipment (Complete)
Ceramic Color & Chemical Mfg. Co.
Chicago Vitreous Enamel Product Co.
Frazier-Simplex, Inc.
The Hommel Co., O., Inc.
The Vitro Mfg. Co.

Enameling Furnaces
Carborundum Co.
Ceramic Color & Chemical Mfg. Co.
Chicago Vitreous Enamel Product Co.
Electro Refractories & Alloys Corp.
The Hommel Co., O., Inc.
Lancaster Iron Works, Inc.
Norton Co.

Enameling Iron (Sheet)
American Rolling Mill Co.
Bethlehem Steel Co.

Enameling Muffles
Bethlehem Steel Co.
Carborundum Co. (*Carbofrax*)
Chicago Vitreous Enamel Product Co.
Electro Refractories & Alloys Corp.
Frazier-Simplex, Inc.
Norton Co. (*Alundum*)

Enameling (Practical Service)
Ceramic Color & Chemical Mfg. Co.
Chicago Vitreous Enamel Product Co.
The Hommel Co., O., Inc.
Metal & Thermit Corp.
The Porcelain Enamel & Mfg. Co.
Titanium Alloy Mfg. Co.
The Vitro Mfg. Co.

Enamels
Ceramic Color & Chemical Mfg. Co.
Chicago Vitreous Enamel Product Co.
Du Pont de Nemours, E. I., & Co., Inc., R. & H. Chemicals Dept.
Harshaw Chemical Co.
The Hommel Co., O., Inc.
The Porcelain Enamel and Mfg. Co.
The Vitro Mfg. Co.

Enamel Oxide
Du Pont de Nemours, E. I., & Co., Inc., R. & H. Chemicals Dept.

Enamels (Porcelain)
Ceramic Color & Chemical Mfg. Co.
Chicago Vitreous Enamel Product Co.
The Hommel Co., O., Inc.
The Porcelain Enamel & Mfg. Co.
Titanium Alloy Mfg. Co.
The Vitro Mfg. Co.

Equipment (Porcelain Enameling)
Ceramic Color & Chemical Mfg. Co.
Chicago Vitreous Enamel Product Co.
The DeVilbiss Co.
Hardinge Company, Inc.
The Hommel Co., O., Inc.

Exhaust Systems
The DeVilbiss Co.

Feldspar
Ceramic Color & Chemical Mfg. Co.
Du Pont de Nemours, E. I., & Co., Inc., R. & H. Chemicals Dept.
Harshaw Chemical Co.
The Hommel Co., O., Inc.
Paper Makers Importing Co.
The Porcelain Enamel and Mfg. Co.
The Vitro Mfg. Co.

Fire Brick
Carborundum Co.
Corhart Refractories Co.
Denver Fire Clay Co
Electro Refractories & Alloys Corp.
Norton Co.

Fire Brick—Process Equipment
Lancaster Iron Works, Inc.

Fire Clay
Spinks, H. C., Clay Co.

Flint
Ceramic Color & Chemical Mfg. Co.
Du Pont de Nemours, E. I., & Co., Inc. R. & H. Chemicals Dept.
Harshaw Chemical Co.
The Hommel Co., O., Inc.
Paper Makers Importing Co.
The Porcelain Enamel and Mfg. Co.

Flint Pebbles
Ceramic Color & Chemical Mfg. Co.
Chicago Vitreous Enamel Product Co.
The Hommel Co., O., Inc.
The Vitro Mfg. Co.

Floors (Non-Slip)
Norton Co.

Fluorspar
Harshaw Chemical Co.

French Flint
Paper Makers Importing Co.

Frit
Allied Engineering Co.
Ceramic Color & Chemical Mfg. Co.
Chicago Vitreous Enamel Product Co.
Harshaw Chemical Co.
The Hommel Co., O., Inc.
Porcelain Enamel & Mfg. Co.
Titanium Alloy Mfg. Co.
The Vitro Mfg. Co.

Frosting Mixtures
Harshaw Chemical Co.

Fuel Oil Systems and Control, Stokers
Bethlehem Steel Co.
Frazier-Simplex, Inc.

Furnaces
Allied Engineering Co.
Carborundum Co. (*Carboradiant*)
Chicago Vitreous Enamel Product Co.
Denver Fire Clay Co.
Frazier-Simplex, Inc.
The Hommel Co., O., Inc.
Swindell-Dressler Corp.

Furnaces-Enameling
Swindell-Dressler Corp.

Glass Bending Ovens, Glass Decorating Machines
Frazier-Simplex, Inc.

Glass Equipment
Hartford-Empire Co.
Lancaster Iron Works, Inc.

Glass Melting Tanks and Furnaces
Frazier-Simplex, Inc.

Glass Thickness Gauge
Bausch & Lomb Optical Co.

Glaze and Body Spar
Ceramic Color & Chemical Mfg. Co
Du Pont de Nemours, E. I., & Co., Inc. R. & H. Chemicals Dept
Harshaw Chemical Co.
The Hommel Co., O., Inc.
Paper Makers Importing Co.
The Porcelain Enamel and Mfg. Co.
The Vitro Mfg. Co.

Glazes and Enamels
Ceramic Color & Chemical Mfg. Co.
Chicago Vitreous Enamel Product Co.
Drakenfeld, B. F., & Co.
Du Pont de Nemours, E. I., & Co., Inc., R. H. Chemicals Dept.
Harshaw Chemical Co.
The Hommel Co., O., Inc.
The Porcelain Enamel & Mfg. Co.
Titanium Alloy Mfg. Co.
The Vitro Mfg. Co.

Glaze Spar
Ceramic Color & Chemical Mfg. Co.
Du Pont de Nemours, E. I., & Co., Inc., R. & H. Chemicals Dept.
Harshaw Chemical Co.
The Hommel Co., O., Inc.
Paper Makers Importing Co.

Goggles
Cover, H. S.
Willson Products, Inc.

Gold
Ceramic Color & Chemical Mfg. Co.
Drakenfeld, B. F., & Co.

Du Pont de Nemours, E. I., & Co., Inc. R. H. & Chemicals Dept.
Harshaw Chemical Co.
The Hommel Co., O., Inc.
The Vitro Mfg. Co.

Gold Decorations
Du Pont de Nemours, E. I., & Co., Inc., R. & H. Chemicals Dept.

Granulators
Hardinge Company, Inc.
Lancaster Iron Works, Inc.

Grinding Wheels
Carborundum Co. (*Carborundum and Alozite*)
Chicago Vitreous Enamel Product Co.
Norton Co. (*Alundum-Crystolon*)

Hearths
Carborundum Co. (*Carbofrax* heat treating)
Corhart Refractories Co.
Electro Refractories & Alloys Corp.
Norton Co. (*Crystolon*)

Hearths (Fused Al_2O_3, SiC)
Electro Refractories & Alloys Corp.

Hearths (High Aluminous Clay, Electrically Sintered Aluminum Oxide, Silicon Carbide)
Carborundum Co.
Norton Co.

Hose (Air and Fluid)
The DeVilbiss Co.

Hydrofluoric Acid
Harshaw Chemical Co.

Iron Chromite
Harshaw Chemical Co.

Iron (Enameling)
American Rolling Mill Co.
Bethlehem Steel Co.

Iron Oxide
Ceramic Color & Chemical Mfg. Co.
Drakenfeld, B. F., & Co.
Du Pont de Nemours, E. I., & Co., Inc., R. & H. Chemicals Dept.
Harshaw Chemical Co.
The Hommel Co., O., Inc.
The Porcelain Enamel and Mfg. Co.
The Vitro Mfg. Co.

Kaolin
Ceramic Color & Chemical Mfg. Co.
Edgar Brothers Co.
Edgar Plastic Kaolin Co.
Hammill & Gillespie, Inc.
Harshaw Chemical Co.
The Hommel Co., O., Inc.
Paper Makers Importing Co.
United Clay Mines Corp.
The Vitro Mfg. Co.

Kellog AA Refractories
Electro Refractories & Alloys Corp.

Kilns, China (Decorating)
Allied Engineering Co.
Denver Fire Clay Co.
Drakenfeld, B. F., & Co.
Frazier-Simplex, Inc.
The Hommel Co., O., Inc.
Swindell-Dressler Corp.

Kilns-(Electric, Circular, Tunnel)
Allied Engineering Co.
Swindell-Dressler Corp.

Kiln Furniture (Silicon Carbide, Semi-Silicon Carbide) (Refractory)
Electro Refractories & Alloys Corp.
Louthan Mfg. Co.

Kyanite
Celo Mines, Inc.

Kryolith (See Cryolite)
Pennsylvania Salt Mfg. Co.

Laboratory Ware
Norton Co.

Lehr Tile (High Aluminous Clay, Electrically Sintered Aluminum Oxide, Silicon Carbide)
Carborundum Co.
Electro Refractories & Alloys Corp.

Lehrs
Frazier-Simplex Inc.
Swindell-Dressler Corp.

Lehrs (Electric or Fuel Heated)
Frazier-Simplex, Inc.
Swindell-Dressler Corp.

Lehr Loaders
Frazier-Simplex, Inc.

Linings (Furnace Refractory, Block Refractory Plate, Brick and Tile)
Carborundum Co.
Chicago Vitreous Enamel Product Co.
Corhart Refractories Co.
Denver Fire Clay Co.
Electro Refractories & Alloys Corp.
Norton Co.
The Vitro Mfg. Co.

Lithium Carbonate
Foote Mineral Co.

Lithium Minerals
Foote Mineral Co.

Magnesia (Fused)
Electro Refractories & Alloys Corp.
Norton Co.

Magnesia (Sintered, Calcined)
Drakenfeld, B. F., & Co.
Du Pont de Nemours, E. I., & Co., Inc., R. & H. Chemicals Dept.
Harshaw Chemical Co.
The Hommel Co., O., Inc.
The Porcelain Enamel and Mfg. Co.

Magnesite
Ceramic Color & Chemical Mfg. Co.
Drakenfeld, B. F., & Co.
Du Pont de Nemours, E. I., & Co., Inc., R. & H. Chemicals Dept.
Hammill & Gillespie, Inc.
Harshaw Chemical Co.
The Hommel Co., O., Inc.
The Vitro Mfg. Co

Magnesite Calcined
Foote Mineral Co.

Magnesium Carbonate
Harshaw Chemical Co.

Manganese
Ceramic Color & Chemical Mfg. Co.
Drakenfeld, B. F., & Co.
Du Pont de Nemours, E. I., & Co., Inc., R. & H. Chemicals Dept.
Hammill & Gillespie, Inc.
Harshaw Chemical Co.
The Hommel Co., O., Inc.
The Vitro Mfg. Co.

Manganese Dioxide
Foote Mineral Co.

Manganese (Oxide)
Ceramic Color & Chemical Mfg. Co.
Corhart Refractories Co.
Du Pont de Nemours, E. I., & Co., Inc., R. & H. Chemicals Dept.
Harshaw Chemical Co.

Masks (Breathing)
The DeVilbiss Co.
Willson Products, Inc.

Metals (Porcelain Enameling)
American Rolling Mill Co.
Bethlehem Steel Co.

Microscopes (Polarizing)
Bausch & Lomb Optical Co.

Minerals
Ceramic Color & Chemical Mfg. Co.
Drakenfeld, B. F., & Co.
Du Pont de Nemours, E. I., & Co., Inc., R. & H. Chemicals Dept.
Hammill & Gillespie, Inc.
Harshaw Chemical Co.
The Hommel Co., O., Inc.
The Vitro Mfg. Co.

Mixers
Ransome Concrete Machinery Co.

Mixers (Batch)
Lancaster Iron Works, Inc.

Mold Sanders
Lancaster Iron Works, Inc.

Muffles (Furnace)
Allied Engineering Co.
Carborundum Co. (*Carbofrax*)
Chicago Vitreous Enamel Product Co.
Denver Fire Clay Co.
Electro Refractories & Alloys Corp.
Frazier-Simplex, Inc.
Norton Co.

Muffles (Laboratory)
Electro Refractories & Alloys Corp.

Mullite (Refractories)
Electro Refractories & Alloys Corp.

Muriatic Acid
Denver Fire Clay Co.
Harshaw Chemical Co.
The Hommel Co., O., Inc.
Pennsylvania Salt Mfg. Co.

Needle Antimony
Harshaw Chemical Co.

Nickel Salts
Harshaw Chemical Co.

Nitrates (Cobalt, Sodium)
Ceramic Color & Chemical Mfg. Co.
Drakenfeld, B. F., & Co.
Du Pont de Nemours, E. I., & Co., Inc., R. & H. Chemicals Dept
Harshaw Chemical Co.
The Hommel Co., O., Inc.
The Vitro Mfg. Co.

Nitre
Harshaw Chemical Co.

Non-Gro Refractories
Electro Refractories & Alloys Corp.

Norbide (Norton Boron Carbide)
Norton Co.

Olivine
Du Pont de Nemours, E. I., & Co., Inc., R. & H. Chemicals Dept.

Opacifiers
Ceramic Color & Chemical Mfg. Co.
Du Pont de Nemours, E. I., & Co., Inc., R. & H. Chemicals Dept.
Harshaw Chemical Co.
The Hommel Co., O., Inc.
Metal & Thermit Corp.
The Porcelain Enamel & Mfg. Co.
Titanium Alloy Mfg. Co.
The Vitro Mfg. Co.

Overglaze Colors
Du Pont de Nemours, E. I., & Co., Inc., R. & H. Chemicals Dept.

Oxides
Ceramic Color & Chemical Mfg. Co.
Chicago Vitreous Enamel Product Co.
Drakenfeld, B. F., & Co.
Du Pont de Nemours, E. I., & Co., Inc., R. & H. Chemicals Dept.
Harshaw Chemical Co.
Metal & Thermit Corp.
Porcelain Enamel & Mfg. Co.
Titanium Alloy Mfg. Co.
The Vitro Mfg. Co.

Palladium Decorations
Du Pont de Nemours, E. I., & Co., Inc., R. & H. Chemicals Dept.

Pins
Chicago Vitreous Enamel Product Co.
The Hommel Co., O., Inc.
Louthan Mfg. Co.
Potters Supply Co.

Pins (Tile Setter)
Louthan Mfg Co.

Platinum Decorations
Du Pont de Nemours, E. I., & Co., Inc., R. & H. Chemicals Dept.

Polariscopes
Bausch & Lomb Optical Co.
Frazier-Simplex, Inc.

Porcelain Enameling Service (Practical)
American Rolling Mill Co.
Ceramic Color & Chemical Mfg. Co.
Chicago Vitreous Enamel Product Co.
Hardinge Company, Inc.
The Hommel Co., O., Inc.
The Porcelain Enamel & Mfg. Co.
Titanium Alloy Mfg. Co.
The Vitro Mfg. Co.

Porcelain Enamels
Ceramic Color & Chemical Mfg. Co.
Chicago Vitreous Enamel Product Co.
Du Pont de Nemours, E. I., & Co., Inc., R. & H. Chemicals Dept.
The Porcelain Enamel & Mfg. Co.
Titanium Alloy Mfg. Co.
The Vitro Mfg. Co.

Potash (Carbonate)
Ceramic Color & Chemical Mfg. Co.
Du Pont de Nemours, E. I., & Co., Inc R. & H. Chemicals Dept.
Harshaw Chemical Co.
The Hommel Co., O., Inc.
Solvay Sales Corp.
The Vitro Mfg. Co.

Producer Glass Plants
Frazier-Simplex, Inc.

Pug Mills
Lancaster Iron Works, Inc.

Pyrites (Natural Iron Sulphide)
Foote Mineral Co.

Pyrometer Tubes
Carborundum Co.
Electro Refractories & Alloys Corp.
Montgomery Porcelain Products Co.

Pyrometer Tubes (Refractory and Hard Porcelain)
Denver Fire Clay Co.
McDanel Refractory Porcelain Co.
Norton Co.

Pyrometers (Optical, Radiation, Surface, Immersion, Needle)
Pyrometer Instrument Co.

Pyrometric Cones
The Edward Orton, Jr., Ceramic Foundation

Racks, Firing (Refractory)
Louthan Mfg. Co.

Raw Material Handling Equipment
Frazier-Simplex, Inc.
Lancaster Iron Works, Inc.

Refractometers
Bausch & Lomb Optical Co.

Refractories
Carborundum Co.
Corhart Refractories Co.

Denver Fire Clay Co.
Electro Refractories & Alloys Corp.
Louthan Mfg. Co.
Norton Co.

Refractory Materials
Carborundum Co.
Chicago Vitreous Enamel Product Co.
Corhart Refractories Co.
Denver Fire Clay Co.
Electro Refractories & Alloys Corp.
Louthan Mfg. Co.
Norton Co.
Titanium Alloy Mfg. Co.

Represses (Automatic)
Lancaster Iron Works, Inc.

Respirators
Chicago Vitreous Enamel Product Co.
Cover, H. S.
The DeVilbiss Co.
The Hommel Co., O., Inc.
Willson Products, Inc.

Rutile
Ceramic Color & Chemical Mfg. Co.
Drakenfeld, B. F., & Co.
Du Pont de Nemours, E. I., & Co., Inc., R. & H. Chemicals Dept.
Foote Mineral Co.
Harshaw Chemical Co.
The Hommel Co., O., Inc.
Metal & Thermit Corp.
Titanium Alloy Mfg. Co.
The Vitro Mfg. Co.

Saggers
Carborundum Co.
Electro Refractories & Alloys Corp.
Norton Co.
Potters Supply Co.

Salt Cake
American Potash & Chemical Co.
Harshaw Chemical Co.
The Hommel Co., O., Inc.
Pennsylvania Salt Mfg. Co.

Sandblast Helmets
Willson Products, Inc.

Sand Grinder and Sifters
Lancaster Iron Works, Inc.

Saponin
The Hommel Co., O., Inc.

Selenite of Sodium
Drakenfeld, B. F., & Co.
The Hommel Co., O., Inc.
The Vitro Mfg. Co.

Selenium
Ceramic Color & Chemical Mfg. Co.
Drakenfeld, B. F., & Co.
Du Pont de Nemours, E. I., & Co., Inc., R. & H. Chemicals Dept.
Harshaw Chemical Co.
The Hommel Co., O., Inc.
The Vitro Mfg. Co.

Setters (Tableware)
Louthan Mfg. Co.

Sheets (Enameling Iron)
American Rolling Mill Co.
Bethlehem Steel Co.

Silica (Fused)
Electro Refractories & Alloys Corp.
The Hommel Co., O., Inc.

Silicate of Soda
Ceramic Color & Chemical Mfg. Co.
Denver Fire Clay Co.
The Hommel Co., O., Inc.
Harshaw Chemical Co.

Silicon Carbide
Carborundum Co.
Electro Refractories & Alloys Corp.
Norton Co.

Silicon Carbide Firesand
Carborundum Co.

Sillimanite Refractories
Electro Refractories & Alloys Corp.

Slabs (Furnace)
Carborundum Co.
Electro Refractories & Alloys Corp.
Norton Co.

Soda Ash
American Potash and Chemical Corp.
Ceramic Color & Chemical Mfg. Co.
Denver Fire Clay Co.
Du Pont de Nemours, E. I., & Co., Inc., R. & H. Chemicals Dept.
Harshaw Chemical Co.
The Hommel Co., O., Inc.
Pennsylvania Salt Mfg. Co.
Solvay Sales Corp.
The Vitro Mfg. Co.

Sodium Antimonate
Ceramic Color & Chemical Mfg. Co.
Drakenfeld, B. F., & Co.
Du Pont de Nemours, E. I., & Co., Inc., R. & H. Chemicals Dept.
Harshaw Chemical Co.
The Hommel Co., O., Inc.
Metal & Thermit Corp.
The Vitro Mfg. Co.

Sodium Fluoride
Ceramic Color & Chemical Mfg. Co.
Denver Fire Clay Co.
Drakenfeld, B. F., & Co.
Du Pont de Nemours, E. I., & Co., Inc., R. & H. Chemicals Dept.
Harshaw Chemical Co.
The Hommel Co., O., Inc.
The Vitro Mfg. Co.

Sodium Metasilicate
Harshaw Chemical Co.

Sodium Nitrite
Harshaw Chemical Co.

Sodium Silica Fluoride
Ceramic Color & Chemical Mfg. Co.
Du Pont de Nemours, E. I., & Co., Inc., R. & H. Chemicals Dept.
Harshaw Chemical Co.
The Hommel Co., O., Inc.

Sodium Uranate
Harshaw Chemical Co.

Soot Blowers
Frazier-Simplex, Inc.

Special Machines
Frazier-Simplex, Inc.

Spar
Ceramic Color & Chemical Mfg. Co.
Du Pont de Nemours, E. I., & Co., Inc. R. & H. Chemicals Dept.
Harshaw Chemical Co.
The Hommel Co., O., Inc.
Paper Makers Importing Co.
The Vitro Mfg. Co.

Spray Booths
The DeVilbiss Co.

Spraying Equipment
The DeVilbiss Co.

Spurs
Louthan Mfg. Co.
Potters Supply Co.

Stacks
Lancaster Iron Works, Inc.

Steel Plate Construction
Bethlehem Steel Co.
Lancaster Iron Works, Inc.

Stilts
Louthan Mfg. Co.
Potters Supply Co.

Sulfuric Acid
Denver Fire Clay Co.
Harshaw Chemical Co.
The Hommel Co., O., Inc.
Pennsylvania Salt Mfg. Co.

Talc
Ceramic Color & Chemical Mfg. Co.
Du Pont de Nemours, E. I., & Co., Inc., R. & H. Chemicals Dept.
Hammill & Gillespie, Inc.
Harshaw Chemical Co.
The Hommel Co., O., Inc.
Paper Makers Importing Co.

Tanks
Frazier-Simplex, Inc.

Tank Blocks
Corhart Refractories Co.

Tanks (Pickle)
Chicago Vitreous Enamel Product Co.
The Hommel Co., O., Inc.

Tanks for Raw Material Steel or Concrete
Bethlehem Steel Co.
Lancaster Iron Works, Inc.

Tile (Floor)
Norton Co.

Tile (Muffle)
Carborundum Co.
Electro Refractories & Alloys Corp.
Norton Co.

Tile Setter Pins
Louthan Mfg. Co.

Tile (Refractory)
Carborundum Co. (*Carbofrax*)
Chicago Vitreous Enamel Product Co.
Denver Fire Clay Co.
Electro Refractories & Alloys Corp.
Norton Co.

Tile (Wall)
Denver Fire Clay Co.

Tin Oxide
Ceramic Color & Chemical Mfg. Co.
Drakenfeld, B. F., & Co.
Du Pont de Nemours, E. I., & Co., Inc., R. & H. Chemicals Dept.
The Hommel Co., O., Inc.
Metal & Thermit Corp.
The Vitro Mfg. Co.

Titanium
Ceramic Color & Chemical Mfg. Co.
Drakenfeld, B. F., & Co.
Harshaw Chemical Co.
The Hommel Co., O., Inc.
Titanium Alloy Mfg. Co.
The Vitro Mfg. Co.

Titanium Oxide
Ceramic Color & Chemical Mfg. Co.
Drakenfeld, B. F., & Co.
Du Pont de Nemours, E. I., & Co., Inc. R. & H. Chemicals Dept.
Harshaw Chemical Co.
The Hommel Co., O., Inc.
Metal & Thermit Corp.
Titanium Alloy Mfg. Co.
The Vitro Mfg. Co.

Tri Sodium Phosphate
Harshaw Chemical Co.

Trucks
Lancaster Iron Works, Inc.

Tubes (Insulating)
Carborundum Co.
Louthan Mfg. Co.
McDanel Refractory Porcelain Co.
Norton Co.

Tubes (Pyrometer)
Carborundum Co.
Denver Fire Clay Co.
Electro Refractories & Alloys Corp.
McDanel Refractory Porcelain Co.
Norton Co.

Uranium Oxide
Harshaw Chemical Co.

Uranium Oxide (Yellow-Orange-Black)
Du Pont de Nemours, E. I., & Co., Inc., R. & H. Chemicals Dept.
The Vitro Mfg. Co.

Water Softening Plants
Frazier-Simplex, Inc.

Wet Enamel
Ceramic Color & Chemical Mfg. Co.
Chicago Vitreous Enamel Product Co.
The Hommel Co., O., Inc.
The Porcelain Enamel & Mfg. Co.
Titanium Alloy Mfg. Co.
The Vitro Mfg. Co.

Whiting
Ceramic Color & Chemical Mfg. Co.
Drakenfeld, B. F., & Co.
Du Pont de Nemours, E. I., & Co., Inc., R. & H. Chemicals Dept.
Hammill & Gillespie, Inc.
Harshaw Chemical Co.
The Hommel Co., O., Inc.
Paper Makers Importing Co.
The Vitro Mfg. Co.

Winding Drums
Lancaster Iron Works, Inc.

Zinc Oxide
Ceramic Color & Chemical Mfg. Co.
Du Pont de Nemours, E. I., & Co., Inc., R. & H. Chemicals Dept.
Harshaw Chemical Co.
The Hommel Co., O., Inc.
The Vitro Mfg. Co.

Zircon
Foote Mineral Co.

Zirconia
Ceramic Color & Chemical Mfg. Co.
Du Pont de Nemours, E. I., & Co., Inc., R. & H. Chemicals Dept.
Harshaw Chemical Co.
The Hommel Co., O., Inc.
Metal & Thermit Corp.
Titanium Alloy Mfg. Co.
The Vitro Mfg. Co.

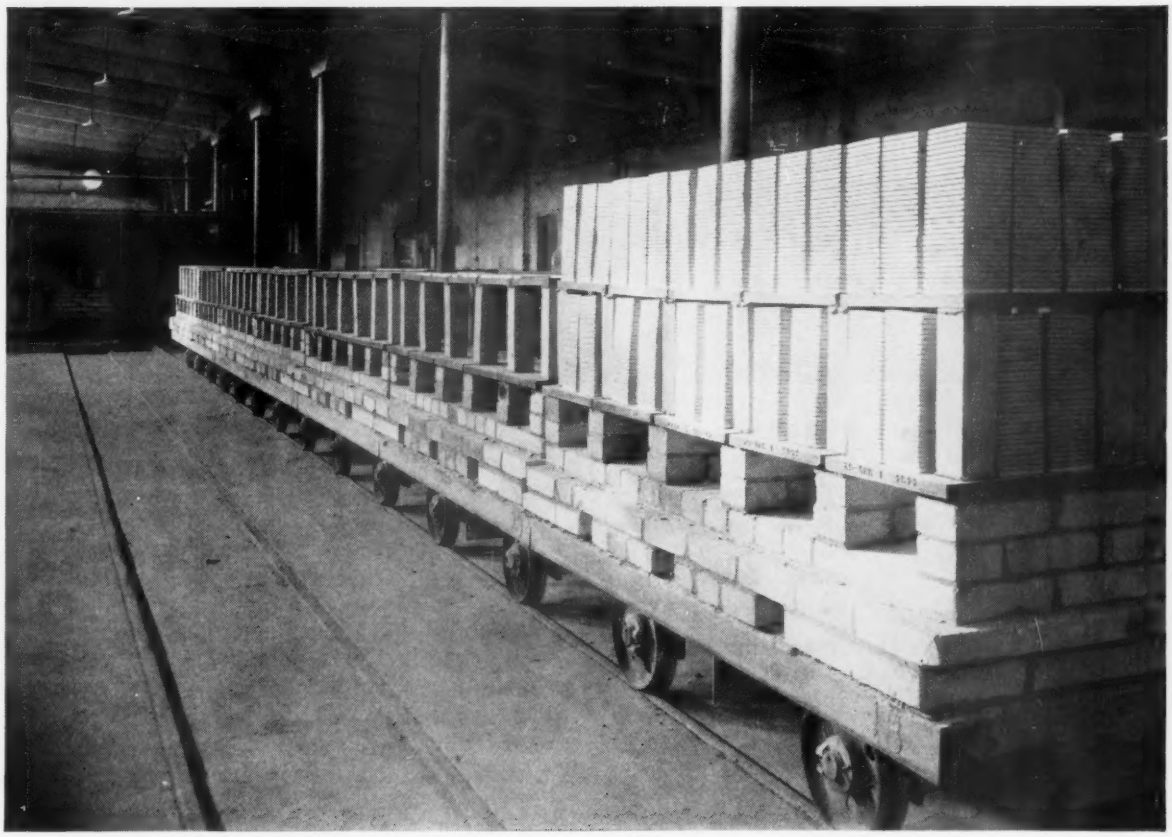
Zirconium Oxide
Foote Mineral Co.

Zirkite (Natural ZrO_2)
Foote Mineral Co.

Another plant standardizes on

"CARBOFRAX" KILN FURNITURE

REG. U. S. PAT. OFF.



THIS tile plant uses "Carbofrax" setter tile in both glost and bisque kilns. Their reasons for so doing are the same that have led other plants to specify these tile—resistance to warping, cracking and oxidation and a variety of tile suited to any particular application. The experience and service of the largest organization in the world, producing refractories are offered to you to help you solve any ceramic setting problems you may have.

REFRACTORY CARBORUNDUM PRODUCTS

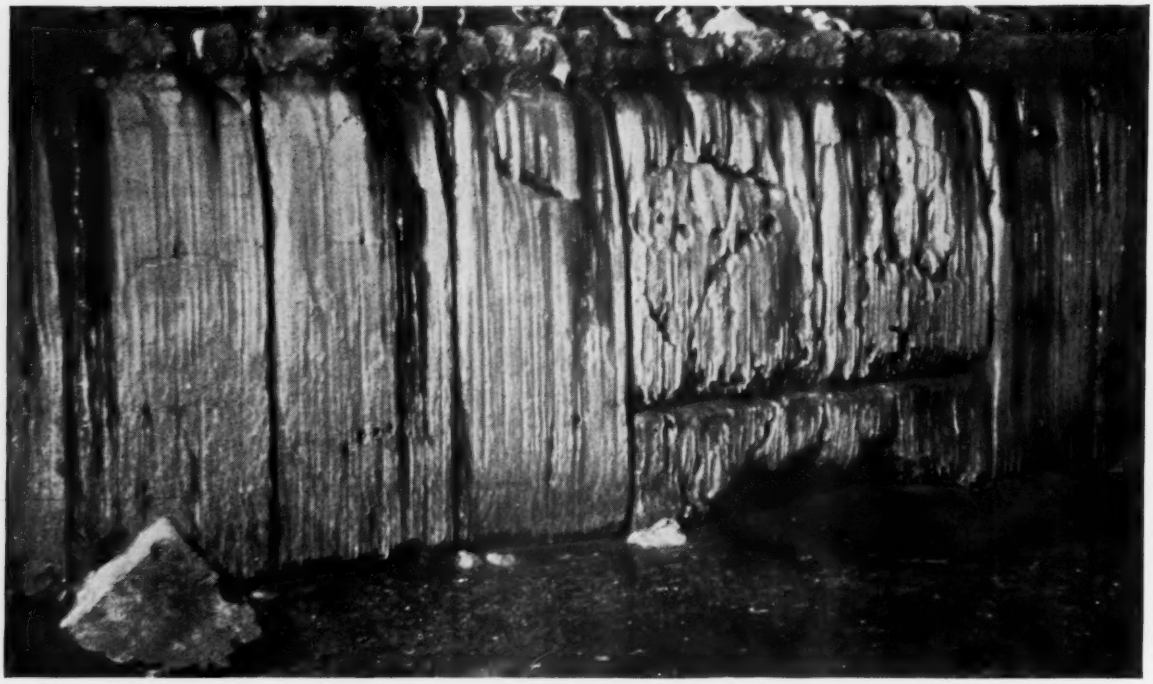
REG. U. S. PAT. OFF.

THE CARBORUNDUM COMPANY, REFRACTORY DIVISION, PERTH AMBOY, N. J.

REG. U. S. PAT. OFF.

District Sales Branches: Chicago, Philadelphia, Detroit, Cleveland, Boston, Pittsburgh. Agents: McConnell Sales and Engineering Corp., Birmingham, Ala.; Christy Fire Brick Company, St. Louis; Harrison and Company, Salt Lake City, Utah; Pacific Abrasive Supply Co., Los Angeles, San Francisco, Seattle; Denver Fireclay Co., El Paso, Texas.

(Carborundum and Carbofrax are registered trade-marks of The Carborundum Company)



LONGER LIFE PLUS HEAVIER PULL EQUALS LOWER GLASS COSTS

Total Life . . . . . 678 days (including idle days)

Glass Produced . . 45,825 total tons produced at feeders

Gas Consumed . . 344,550,000 cubic feet total (1050 B.t.u.)

Idle Days 49

Operating Days . . 629

Melting Area . . . 392 square feet

20% cullet in batch

THE data above was turned over to us by the operators of a balanced Corhart Electrocast* tank which was shut down according to a prearranged schedule on December 22, 1937. This tank melted clear flint glass for a general line of packers and proprietary ware.

Please note that this tank averaged 72.85 tons of glass per day, melting one ton of glass for each 5.38 square feet of melting area. Please note also that, without any correction for idle days or heating-up period, *the total fuel consumed was 7518.8 cubic feet per ton of glass.*

Each combustion engineer has his own method of figuring fuel consumption per ton of glass for operating days. There is sufficient basic data at the left for each one to arrive at his own answer. With our own method, we find the gas consumption per ton of glass produced on operating days to be 7192.3 cubic feet.

The salient features of this record are the low fuel cost, long life, satisfactory operation and the extraordinarily high rating.

Please permit us to repeat again that Corhart does not "claim credit" for low fuel consumption and high rating—except insofar as these factors are affected by the use of a refractory that can *stand the gaff* of a heavier pull over a longer period of time . . . We submit that Corhart Electrocast *is that refractory.*

Corhart Refractories Co., Incorporated, 16th & Lee Sts., Louisville, Ky. *In Europe:* L'Electro Refractaire, Paris. *In Japan:* Asahi Glass Co., Tokio.

QUALITY ECONOMY ENDURANCE

CORHART ELECTROCAST REFRACTORIES

*Manufactured under and by an exclusive patented process

THE BULLETIN
OF THE AMERICAN CERAMIC SOCIETY

A Monthly Publication Devoted to Proceedings of the Society and Promotion of Coöperative Research of Technical, Scientific, and Art Questions

VOLUME 17 JUNE, 1938 NUMBER 6

PAPERS

UNIFORM CLASSIFICATION OF CERAMIC PLASTIC CLAYS*

By Otakar Kallauner

I. Introduction

Ceramic plastic clays are dispersed heterogeneous systems, compounded in a definite way of mineral and to a certain extent of organic substances. They are characterized principally by their plasticity. This plasticity again is characterized in that it gives workability with water and with nonplastics into objects sufficiently firm to maintain their given shape in drying and firing and thus to attain at the same time considerable resistance and hardness.

The plasticity is conditional to the presence of a certain amount of fine "plastic substance," which generally is designated as "clay substance." This substance possesses chemically no individuality, but it represents a mixture of several (oftentimes many) different materials. The ingredients effecting plasticity are represented chiefly by a group of materials resembling mica, such as halloysite, kaolinite, beidellite, montmorillonite, pyrophyllite, nontronite, glauconite, steatite, chlorite, etc., and also partly by a group of micaceous materials, such as muscovite, sericite, biotite, hydromica, etc. There are, furthermore, the colloids of the allophanoid type, alumina hydrate, iron hydrate, some colloidal oxides, and organic colloids, *e.g.*, humus substances. A complete decomposability by concentrated boiling sulfuric acid is common to all of these effective substances.

According to Seger's definition, to the constituents of the plastic substance is accorded a maximum size of 0.01 millimeter. Those which are smaller than 0.002 millimeter are considered to be especially effective. Apart from the plastic substance, there is also present in ceramic raw materials a series of less finely dispersed nonplastic substances which are chiefly quartz, amphibole, garnet, tourmaline, epidote, titanium, zirconium, oxides of iron and titanium, sulfide of iron, carbonate of lime, magnesium, iron, and the sulfate group of lime, as well as different organic substances and microörganisms. According to their size, the mineral substances may be more or less harmful to ceramic manufacturing and some of them, in certain amounts, can have a detrimental effect owing to their chemical composition (harmful substances).

For a long time, attempts have been made to find a classification for the great complexity of plastic ceramic clays. The attempts made in this direction are based either on genesis (geological viewpoint), petrographic composition, especially in the consideration of typical minerals stipulating plasticity (petrographic viewpoint), chemical constitution in part or wholly (chemical viewpoint), important technological properties (technological), and their use in the various branches of production (users', objective, and commercial viewpoints).

It was shown that a classification, based upon one point of view alone, was wholly inadequate. Consequently, in recent years, such attempts have been based upon several viewpoints. It is true that such efforts have more or less eliminated a number of former shortcomings, but not

* Received July 23, 1937. Translated from the German by T. W. Garve.

one of the chief handicaps causing lack of uniformity was eliminated. Even an international unification, in the form of an attempt, has so far been missing, and thus there does not exist a precept for a classification. This lack is greatly felt, not alone in scientific and technological but also in commercial circles, and it would be proper, therefore, if the professional circles, especially in countries with a strongly developed ceramic industry, were to remedy this need by a unified endeavor.

Should this suggestion ever be realized, it would be necessary first to settle some doubtful points, mainly as to the plastic substance, to justify a definite solution of the problem of a uniform classification. It would be necessary, furthermore, to reëxamine critically, systematically, and statistically the practical suitability and scientific justification of proposed methods, chiefly for the determination of dispersibility as well as of petrographic and special chemical research of finely dispersed systems. Not only the original but also the "desorptioned" state should be considered to attain eventually a definite sorption capacity, *i.e.*, the stabilized state of clays. It would become possible thereby to approach definitely stable conditions, important for the determination of some classification principles. A thorough study of uniform test methods, especially from the technological viewpoint, seems to be a matter of course.

To this end, the outlines are presented of a proposal for the uniform classification of certain plastic clays, which is based primarily upon (*a*) the petrographic-chemical and (*b*) the technological viewpoints. It also considers the consumers' viewpoint. The established extent of the references, unfortunately, does not permit a development of the proposal. This, however, will be done by the technical journals.

The proposal, whose main purpose is suggestive, can not claim a special completeness if only for reasons mentioned in the preceding paragraph. It includes suitable pointers and determinations from various existing proposals, data, or directions, which directly or indirectly have reference to the given classification and also such contributions from personal statistical considerations, experiences, and opinions.

II. Proposed Uniform Classification of Plastic Clays

(1) Petrographic-Chemical Viewpoint

TABLE I

Group		Typical effective plastic ingredients	Customary clay designation
(I)	Sialite	Allophane Halloysite Kaolinite Mica (sericite, hydromica, etc.) Beidellite Montmorillonite Pyrophyllite Nontronite Glauconite	Kaolins, clays, shales, marl, loams, bentonite, bleaching and discoloring clays, etc.
(II)	Alite	Hydrates of alumina and iron	Bauxite Laterite
(III)	Simgite	Stearite Chlorite	Steatites, talcs, certain clays, and marl

The name for groups (I) and (II), after Harrasowitz, was also adopted for group (III). For clays, rich in effective plastic iron-containing ingredients, the following grouping would be more understandable: sialfelite, alfelite, and simgfelite.

The clays are divided more specifically according to the ratios (moduli) of the effective oxides which are bound in plastic substance or are free (hydrated).

Groups (I) and (II)

$$\frac{SiO_2}{Al_2O_3} \cdot \frac{H_2O}{Al_2O_3} \cdot \frac{R_fO_3 + R_aO}{Al_2O_3}.$$

$R_f = [Fe_2]$
$R_a = [Ca, Mg], [K_2, Na_2]$

Group (III)

$$\frac{SiO_2}{MgO} \cdot \frac{H_2O}{MgO} \cdot \frac{Fe_2O_3}{MgO}.$$

The nomenclature of clays is to conform to the predominating effective part of the plastic substance; in the case of approximately equal representatives ($50 \pm 10\%$) of the two most important plastic ingredients it will conform to both components.

Another more complete classification of clays is based upon the quality of the present plastically noneffective quartz as to the amount of plastic substance, *e.g.*, (*a*) strong $> 60\%$, (*b*) medium $> 30\%$, and (*c*) weak $< 30\%$ quartz-containing.

(2) Technological Viewpoint (Table II)

Numerical values of (I), (II), (III), (VI (*a*)), and (VIII) have been partly incorporated and partly determined statistically and proved by experience. For the time being, the divisions for (IV) (VI (*b*)), and (VII) are not given because of

TABLE II

	Properties	Divisions
(I)	Refractory	
(II)	Fusion (sintering)	(*a*) Refractory, cone > 26 (1) Heavy, cone > 10a (2) Light (*b*) Nonrefractory (1) Heavy, cone > 1a (2) Light
(III)	Dispersion according particle size	0.002, 0.005, 0.01, 0.025, 0.5, 0.1, and 0.2 mm.
(IV)	(*a*) Workability and (*b*) bonding power	Valuation according to (*a*) Pfefferkorn - Bowmaker (with establishment of amount of water to normal consistency) (*b*) Absorptive power with 25% and 50% of normal diluent by tensile test
(V)	Color	(*a*) In dry condition (after Ostwald) (*b*) After firing (after Ostwald)
(VI)	Volume change (linear shrinkage)	(*a*) After drying (1) small < 4%, (2) medium < 8%, and (3) large (*b*) After firing
(VII)	Dry strength	
(VIII)	Density after firing (absorption porosity)	(1) Sintering < 2%, (2) density < 8%, and (3) rorosity

Fire: Cones 010a, 1a, and 10; for the determination of (II) other things to be considered.

the lack of statistical material which would refer to a uniform working basis for all firings.

The additive expression of dispersion, *e.g.*, by grain modulus after Abrams, partly up to the maximum grain size 0.01 millimeter (plastic substance) and partly up to 0.2 millimeter (earth), is to be taken into consideration for (III).

The determination of properties of clays is made after (IV), (VI), (VII), and (VIII) by (*a*) preparing immediately after tempering with water and (*b*) aging a certain time after tempering with water (3 days).

(3) Consumers' Viewpoint

Apart from the fundamental classification given in sections (1) and (2), perhaps a special division should be made for single or several branches of utility according to the most important and especially needed properties.

III. Résumé

The lack of a consistent classification of ceramic plastic earths is greatly felt in scientific, technological, and commercial circles, giving impetus to the elimination of such lack. An outline of a proposal is presented, based chiefly upon petrographic-chemical and technological considerations. A division of the mentioned earths is proposed by three main groups with differentiation relative to the moduli of the effective oxides, combined with the plasticizer or free (hydrolized) oxides.

Another detailed classification is based upon quartz, which is ineffective as a plasticizer.

From the technological viewpoint, a classification is prepared relative to refractoriness, fusion, dispersion, workability and bonding power, color, dry and fired shrinkages, dry strength, and density after firing.

STATE INSTITUTE FOR SILICATE INDUSTRY
RYBKOVA STREET 6
BRNO, CZECHOSLOVAKIA

A SENSITIVE HYDROMETER FOR DETERMINING SMALL AMOUNTS OF CLAY OR COLLOIDS IN SOILS*

By George John Bouyoucos

Fig. 1.—A new sensitive hydrometer for determining small amounts of clay or colloids in soils. (manufactured and handled by The Taylor Instrument Co., Rochester, N. Y.)

The hydrometer in general use heretofore for making mechanical analysis of soils has a total range of 0 to 60 grams per liter and is graduated in grams.[1] Obviously a hydrometer with these characteristics does not allow a high degree of accuracy when only small amounts of clay or colloids are present. To remedy this defect, an especially sensitive soil hydrometer has been devised which has a range of 0 to 10 grams per liter and is graduated into 0.2-gram divisions. This special hydrometer (Fig. 1) is heavy, has a large streamline bulb, comes to equilibrium quickly, and is accurate, as is shown by the data in Table I.

Table I

Degree of Sensitivity and Accuracy of the New Soil Hydrometer

Soils No.	Amount of clay in soil suspension: Indicated by hydrometer (%)	Amount of clay in soil suspension: Found by evaporating to dryness and weighing residue (%)
1	3.5	3.7
2	9.8	9.8
3	1.3	1.2
4	1.9	1.7
5	7.4	7.8
6	5.2	5.0
7	9.2	9.4
8	6.5	6.3
9	2.5	2.2
10	7.0	6.8
11(muck)	8.1	9.9
12(ferruginous)	9.4	7.3

These data show a comparison of the amounts of soil indicated by the hydrometer in soil suspensions with the amounts that were found experimentally by evaporating the soil suspensions to dryness and weighing the residue.

Table I shows that the amounts of clay indicated by the hydrometer in soil suspensions are almost exactly the same as those found experimentally by evaporating the soil suspensions to dryness and weighing the residues. The only soils that show an appreciable disagreement are those that have extreme specific gravity, such as the muck and ferruginous soil.

This hydrometer, therefore, fills a need by measuring accurately small amounts of clay or colloid in soils.

Michigan Agricultural Experiment Station
East Lansing, Michigan

* Journal article No. 295 (new series) from the Michigan Agricultural Experiment Station. Received December 17, 1937.

[1] G. J. Bouyoucos, "Directions for Making Mechanical Analysis of Soils by the Hydrometer Method," *Soil Sci.*, **42**, 225–29 (1936).

AN UNUSUAL APPLICATION OF AUTOMATIC SPRAYING OF VITREOUS ENAMEL SLIP*

By Wesley G. Martin

Abstract

A description is presented of the self-contained automatic spraying machine and its assembly and practical operating problems. The practical and economic advantages are discussed and compared with manual spraying.

I. Introduction

The spraying machine described is highly specialized, but the principles and problems involved are of general interest. In manufacturing large, single-piece glass-lined tanks, it became apparent that there were certain physical limitations inherent in the manual spraying of surfaces of 1600 square feet.

(1) One man can spray a large tank in about eight hours. Because, however, a considerable stream of air is pulled through the tanks to remove the enamel dust, the sprayer is constantly confronted with the problem of spraying adjacent to an area sprayed previously and which has dried. It is difficult to join the dry and freshly sprayed areas without leaving a lap-line. While this condition does not affect the utility of the product, the appearance is somewhat objectionable.

(2) Even a good sprayer is likely to make a mistake now and then. In spraying a large tank, if the sprayer's concentration lags for a few minutes, a complete respray may be necessary, adding a considerable sum to the cost of the product.

(3) If two sprayers are spraying in the same tank, they can not work quite as efficiently as they could alone and there will inevitably be some lost time. It is sometimes difficult, moreover, to plan the work so that two sprayers are available at the right time.

For these reasons, and primarily in an effort to improve the general uniformity, quality, and appearance, it was thought desirable to try out a mechanical spraying device.

II. General Description of the Problems

(1) These large tanks are closed except for a hole in one head, which is approximately 12 inches in diameter, and a manway in the other head, 13 by 18 inches. There are numerous small holes for process purposes, but these are of no value during manufacture. Obviously then, the machine must be disassembled to put it in the tank, and no part of the machine can be larger than the 13- by 18-inch manway.

(2) Because the machine must be disassembled for each tank, it would be particularly desirable to simplify the parts and to reduce the number of small pieces which might be lost or misplaced.

(3) It is even more important from a standpoint of reassembly to have the number of parts at a minimum and of simple construction so that they may be put together rapidly.

(4) Furthermore, because the tanks vary roughly from 7 feet to more than 11 feet in diameter, the machine must be capable of adjustment for tank diameter.

(5) The supporting wheels or rollers must be so constructed as to cause the machine to travel in a straight line.

(6) Two automatic spray guns would be most practical for this work, and, because their capacity for spraying enamel is assumed to be constant, it is necessary to provide adjustment in the speeds of the machine so that the square feet per minute sprayed will remain approximately the same, regardless of the diameter of the tank. The maximum air pressure available is about 100 pounds per square inch and enamel pressure is adjusted accordingly.

(7) The forward motion of the machine must, of course, be synchronized with the revolving travel of the spray gun, but once set, this ratio is good for any diameter.

When adjusting for a small-diameter tank, the rate of forward travel of the machine is increased so that the number of square feet per minute sprayed is approximately constant regardless of tank diameter.

(8) A mechanical or automatic method could be provided to blow the spray dust away from the path of the machine, but this could be done more simply and more effectively by the operator attending the machine.

* Presented at the Thirty-Ninth Annual Meeting, American Ceramic Society, New York, N. Y., March 23, 1937 (Enamel Division). Received February 19, 1938.

(9) The enamel is supplied to the spray gun from a conventional, closed pressure tank. The spray guns, however, are constantly moving up and down over a distance of about 10 feet. This changes the hydrostatic pressure relative to the enamel in the pressure tank and adds or substracts from the gage pressure at the guns when spraying

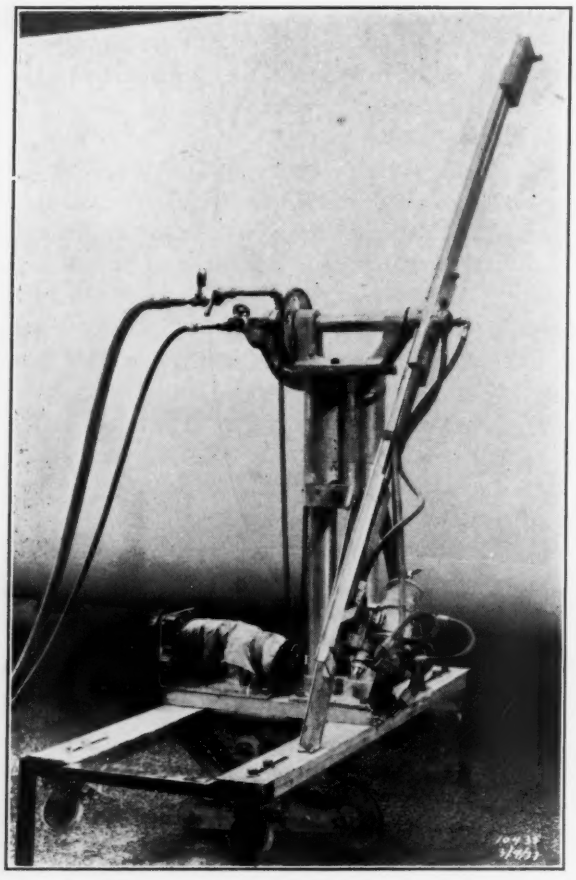


FIG. 1.

at the center of the tank. To overcome this operating difficulty, a small enamel pressure regulator was designed to be mounted near the spray guns.

Because a machine capable of spraying the tank heads and knuckle radii would be much too complicated in view of the rather small area involved, a machine was designed to spray only the cylindrical portion of the tank.

III. Thickness of Enamel

To get the proper thickness of enamel with two automatic spray guns and with the guns making one complete revolution in 28 seconds, the machine traveled forward at the rate of six inches per minute (see Fig. 1). This forward travel combined with the revolution of the gun arm results in the fan-type spray passing over any point of the tank about four times. This overlapping or layer type of application, of course, is an advantage in producing a uniform coating.

In actual use, the rear head of the tank and the knuckle radius are sprayed by hand. Two men then set up the machine, which requires about forty minutes. The machine is then moved into position and adjusted so as to produce a good lap with the hand-sprayed portion which is purposely tapered off in thickness. After the machine has traveled the full length of the tank, it must be disassembled and the front head of the tank must be completed by manual spraying.

There is a certain distance from the gun to the work at which spray loss will be a minimum. This fact is made use of, and the spray machine is so adjusted that the guns pass by the top of the tank at an efficient distance but pass by the bottom of the tank at a greater distance from the surface. Thus the bottom gets less direct spray, but this lack is offset by enamel dust settling down. Such a method may seem inexact, but good uniformity is attained.

IV. Nozzles Used

High-capacity nozzles should be used. The gun bodies are special, having been designed for automatic spraying inside of the pipe. The fluid needle is actuated by an air cylinder as usual. The air cylinder is separated from the liquid enamel passages only by one special, vented stuffing box, the use of which permits the gun to be shorter and lighter. The piston in the air cylinder is operated by air from the atomizing air line, which is connected by ports in the gun body.

Normally, when once the guns have been started, they spray continuously until the tank is finished. Occasionally a gun will clog, but this can usually be overcome by operating the needle valve a few times. The guns are overhauled daily to keep them in first-class condition.

The machine shown in the picture is the result of several changes from the first model. Belt drives have been changed to chain drives with one exception, and it now seems likely that this should also be a chain drive. The chains do not wear badly even though covered with enamel dust, whereas difficulty was encountered with V-belts

which must be adjusted very tight to transmit the slow motion without slipping.

V. Results Obtained

About $5^1/_2$ hours is the total time for a tank 11 feet in diameter and 40 feet in length, using the machine, one sprayer, and a part-time helper. The man hours per tank are about the same as though the tank is sprayed manually by one operator. This reduction in total elapsed time is advantageous in that it speeds up production and thereby makes the other related enameling equipment much more useful.

The quality of the finished enamel coating is improved, and it is comparatively easy to produce an exceptionally uniform application of the enamel.

While much of enamelware produced today would probably be difficult to spray automatically, there may be large quantities that could be coated to advantage by automatic methods. Full automatic spraying of the product has not yet been attempted, but manual and automatic spraying are combined to complete the job. Perhaps in this simple point lies a suggestion of real value.

Spray losses would be larger with automatic spraying than with hand spraying, because in the ordinary type of work, the automatic gun, at times, would be spraying into space beyond the work. If, however, the automatic motions of the spray gun are designed for great flexibility and are controlled perhaps by the use of an electric eye or some other mechanical aid, this type of spray loss could be reduced to a fairly small factor.

Possibly simple automatic spraying could be used on the plain surfaces of complicated shapes, the remainder being sprayed manually, with a resulting increase in uniformity and production.

A. O. Smith Corporation
Milwaukee, Wisconsin

THE ORIGIN, DEVELOPMENT, AND PRESENT STATUS OF NEWCOMB POTTERY*

By Kenneth E. Smith

Abstract

A descriptive résumé is presented of the history and purpose of one of the first art potteries to be organized on a semicommercial basis within an educational institution.

I. History

Newcomb College was founded in 1886. It was made an integral part of Tulane University of Louisiana by an endowment of Mrs. Josephine Louise Newcomb, as a memorial to her deceased daughter, H. Sophie Newcomb. This was a separate college for women, giving all of the educational advantages which before had been offered only to men.

During the early years of the college, an art department was established with Ellsworth Woodward as director, which was known as the Newcomb School of Art. In these early years, Mr. Woodward became aware of the fact that his teaching of design, however successful in itself, was somewhat of a failure, in that it left the graduate no chance of making application of the training she had gained at the expense of so much time and thought. It was decided therefore to establish a pottery.

A few years before any attempt at making pottery at Newcomb College, there was, in New Orleans, a group of interested persons making a few pieces under the direction of Joseph Meyer and George Ohr. These two men had come to New Orleans from Biloxi, Miss., to establish a pottery known as "The Barronne Street Venture."

When it was decided to open a pottery department at Newcomb College, Mary G. Sheerer, who had studied at the Cincinnati Art Academy and Art Student's League, was put in charge. Miss Sheerer, with the aid of Mr. Meyer, guided the experimental stages of bodies, glazes, and decorative treatments to be used.

This establishment of a pottery department within an educational institution, where at least the artistic efforts were a part of the student

* Presented at the Fortieth Annual Meeting, American Ceramic Society, New Orleans, La., March 29, 1938 (Art Division). Received April 7, 1938.

training and the results produced were to be marketed, was decidedly a new venture for the South at the close of the Nineteenth Century. This was particularly true in a college for women. At that time, no doubt, the general opinion among the students and the public was that the actual throwing of the ware on the wheel was not genteel enough or that "life so short and the craft so hard to learn." Mr. Meyer and Mr. Ohr were already skilled potters and to make a start more rapidly they were to throw the shapes from the native clays they had prepared. The students, who had a thorough training in design, were to draw shapes in actual size for the pieces they were to decorate. There was also a class for the students in modeling, in which they made and decorated a few hand-built pieces.

The beginning was made in a modest way in 1896. Because of the plan to use only such materials as could be found close at hand, things were necessarily largely experimental at first. Within less than four years, however, a small collection of ware, sent to the Paris Exposition of 1900, was awarded a bronze medal. This came as an encouraging incentive to further endeavor, and as a result the product has been steadily improved year by year.

The object of Newcomb Pottery primarily was to provide an outlet for the work of graduates of the Art School. Its success financially was to be kept secondary to its artistic success. Its aim was to be honest; those who were to make its history were to be led to look for beauty in their own surroundings in which they lived and which they knew so well. The pottery, to be made by southern women in a southern city, was to bear the character of the south and must not aim, consciously or otherwise, to imitate others.

The Newcomb Pottery was first housed in a part of the boiler room on the Washington Avenue campus. The kiln was built by Mr. Meyer and was of the usual round, updraft pottery type, using coal as the fuel. The clay used at first was a rather sandy, buff-firing ball clay found near Biloxi, Miss. It was soaked in large tubs, agitated, and the slip was poured onto large plaster slabs to dry out. Shortly afterward, a nearly white-firing clay of the same nature was used for some of the ware. These early pieces were stamped on the bottom with a "W" for the white clay and with a "Q" for the buff-colored body.

The quarters in the boiler room soon became too small and a separate building was put up on the campus in a Spanish style of architecture. It contained a well-lighted gallery and salesroom, a clay shop, a kiln room, and several individual studios.

The earliest attempts at decoration were in the nature of natural clay slips and underglaze colors applied to the surface of the green ware. Both painting and spraying of the slip and underglaze colors were employed, sometimes being used together on the same piece. The bisque firing was done at cone 09, and the piece was covered inside and out with a transparent, bright, raw lead glaze, maturing at cone 02.

II. Underglaze Painting

Before many important pieces decorated with slip were produced, that technique was abandoned in favor of the underglaze color painting on the low-fired bisque. The colors found to be the most practical were blue, green, black, and yellow. A transparent bright glaze was still employed and fired as high as cone 3 in some instances.

III. Employment of Ceramic Technologists

While many fine pieces were produced, Mr. Woodward realized that progress could be accelerated by bringing in a technician who had some formal training in ceramics. The disappointments were many, and he felt that better ware could be made by some effort toward technical experimentation and control.

In 1910, Paul E. Cox was employed for this purpose. In addition to improving the body by the addition of feldspar and flint, he developed a raw lead glaze of a semimat texture to be used over the underglaze colors. The underglaze blues and greens were particularly successful with this glaze, and it immediately became more popular with the public than the glossy glaze which had been in use. This same glaze is still used on the standard Newcomb pottery. The technique of underglaze painting was also improved by sponging the green piece carefully to give an even texture to the clay before the bisque firing. The designs were now incised in the green clay pots rather than the practice of painting or spraying a surface pattern over the bisque.

There have been several ceramists in succession in the Pottery since Mr. Cox left Newcomb; among these have been Mr. Miller, Mr.

Wallrath, Mr. Axford, Mr. Rogers, and the writer.

Since the retirement of Miss Sheerer from the school, the ceramic art or pottery class has been under the successive instruction of Miss Juanita Gonzalez, Miss Angela Gregory, and the writer.

IV. Pottery Courses Art Elective in Art Curricula

In 1918, Newcomb College was moved onto its present campus with the Pottery located in the basement of the Art Building. There is a round downdraft kiln of the sagger type, designed by Mr. Cox. The layout which he planned remains nearly the same with the addition of two or three smaller kilns of different types. During the last twelve years, the ceramic chemist has offered a course in ceramic chemistry, which is now required of all second-year pottery students. The ceramic art course is not a major in the College; it is an elective course in B.F.A. or B.A., with a major in the Fine Arts curriculum. The students usually are not allowed to elect ceramic art until the sophomore year, and the limit of required hours in the course is three each week. Students give the subject more time as their interest and schedules permit. The ceramic art and ceramic chemistry courses are now given by one person, and there is an attempt being made to draw them closer together as neither should be taken without the other.

V. Marketing of Newcomb Pottery

At the start of the pottery department, the undergraduate students made and sold their pottery which was approved by the director of the school and the head of the pottery department. When some of the young ladies were graduated from the college they were kept on in the pottery department as decorators. This was the hope of Mr. Woodward from the beginning, that he could train some of his graduates in pottery making as well as in sound fundamentals of art to enable them to earn a living at the school. The ware decorated by these graduate students has been accepted by the public to the extent that retail sales have been as much as $18,000 or $20,000 in some years. The decorators are paid a percentage of the selling price, and the remainder goes to the college for materials, equipment, and salaries for others than the decorators. On the whole, the department has never been entirely self-supporting, although it has largely paid its own way. As soon as enough graduate students were able to supply the demand for the pottery, stress was placed on giving the undergraduate students a more varied use of decorative mediums and the actual making of the entire piece from start to finish.

The standard ware (that still decorated by the graduate students) has become more or less stereotyped in color, decorative treatment, and design. This style is so entrenched on the buying public that it has become a "hall mark" of Newcomb pottery to the extent that when the decorators make a piece even in the same technique but using another color than the traditional soft blue and greens, it will stay on the shelves unnoticed or unrecognized as real Newcomb pottery.

The administration has never vitally concerned itself with the object of making a profit from the sale of the pottery; the intention has been to give the student something with which to supplement her art courses and a medium in which she may actually try out her craftsmanship and applied design. In short, it aims to be a design laboratory, governed by an attainment of skill, by limitations of the material, by a standard of judgment, and by the technical understanding necessary to foretell to some degree the outcome and to produce a sound finished product.

Newcomb Pottery
New Orleans, Louisiana

SALT DOMES AND THEIR CERAMIC DEPOSITS*

By R. A. Steinmayer

Abstract

Salt domes, unique geological formations, have been found to date only on the North American continent. As a class, they are characterized negatively insofar as ceramic deposits are concerned. In a few instances, however, where the intruded salt cores have risen to such heights as to impress themselves topographically, moundlike, into the otherwise featureless relief, there are accessible for exploitation such ceramic deposits as clay, limestone, gypsum, anhydrite, and sands. In addition, many domes bear associated economic deposits of minerals and mineral fuels.

Milleniums before the advent of the white race in Louisiana its aborigines knew and practiced the art of ceramics. Crude and imperfect as their ware may have been, it unquestionably served the purposes for which it was designed. Furthermore, each utensil bore a mark either sculptured in its form, engraved in its pattern, portrayed in its coloring, or, in rare cases, fired in its glazes, which gave to it a tribal and individual distinctiveness. Pottery, however, meant more to the original inhabitants of Louisiana than a utensil in which to cook and serve their foods and drinks. That which served them so usefully throughout their lives was a part of their spiritual selves, and, when the the great Manitou called them to the "Happy Hunting Ground," the pottery went with them, broken as their bodies.

In their (the aborigines) wanderings through the coastal prairie of Louisiana, they found that the larger portion of these lands, with certain exceptions, were, as they are now, soft, unstable swamp lands. These exceptions are the most striking relief features of the coastal prairie. They comprise (1) the long, narrow strips of high, solid ground immediately adjacent and on both sides of the river, (2) the lines of growing and abandoned barrier beaches that fringe the southwestern coast of Louisiana, and (3) the land islands a mile or more in diameter that rise to heights up to 200 feet (61 m.) above the general level of the surrounding marshes. The region, in general, is a coastal deltaic plain dipping slightly gulfward. The prairie is dissected by numerous streams, bordered by natural levee ridges and interlevee basins and dotted by an organized system of innumerable shallow lakes or traversed by tortuous bayous.

The very nature of the terrain determined the Indians' mode of travel; hence, the waterways were their migratory and commercial highways. The striking relief features of the coastal prairie served as encampment stations where they could rest, prepare their food, manufacture their cooking utensils and implements of war and of the chase, inter their dead, and boil down the salt brine.

The discovery of salt springs and seeps on the land islands initiated the salt industry on these islands and gave impetus to an intertribal trade in this commodity. The evaporation of the salt brine required suitable utensils in which to boil the solution; hence, the development of the ceramic industry. That this was an ancient industry of no small size is attested by the countless pot shards found associated with the ash beds on all the islands, particularly Avery Island, Louisiana.

The brine springs on the islands remained an important center of commerce between Louisiana Indian tribes for a long time, to be used later between the Indians and the white settlers in Louisiana and adjoining states. Finally, the industry was taken over by the settlers in this region.

The latter soon found to their sorrow that the supply was too limited to pay the expense of operation during normal times. Consequently, the springs on Avery Island were neglected until the War of 1812, when the price of salt rose sufficiently high to warrant temporary operation. Again, during the Civil War, when the blockade made the product scarce, the springs were systematically worked and were cleaned and deepened. During this operation, a negro workman found a bed of solid rock salt, fifteen feet below the surface, on May 4, 1862. Afterward it was quarried from large open pits until the works were destroyed by the Federal forces under General Banks on April 17, 1863.

* Presented at the Fortieth Annual Meeting, American Ceramic Society, New Orleans, La., March 28, 1938 (General Session on Ceramic Resources of Southern States). Received March 28, 1938.

The importance of salt to the South during the Civil War may be illustrated by the ex-Confederate officer who, in opening a lecture which he gave in Syracuse, New York, startled his audience with the somewhat remarkable query, "Do you know why you Northerners whipped us Southerners?" Upon the surprised ears of his audience fell the terse answer, "Because you had salt."

"These unique salt masses are now found restricted to that region which formed a part of the paleogeographical Eocene Gulf border of the continent, termed the 'Mississippi embayment area,' now lying within the coastal plain of the Gulf of Mexico. One group of domes is situated in the Louisiana-Texas province, the other in the Isthmus of Tehuantepec, Mexico.[1]

"The more extensive Louisiana-Texas province may be subdivided into two subprovinces: the one including the coastal group of domes that skirt the Gulf of Mexico, extending inland a distance approximately 70 miles from just east of the Mississippi River to a short distance below the Rio Grande River; the other, the interior group, on or near the flanks of the Sabine Uplift in Louisiana and Texas and separated from the former by a narrow strip apparently containing no salt domes; the first-named group occurred on the flat coastal prairie of the Gulf, and the latter on the subdued hill lands approximately 100 miles further inland. There is every reason to believe that the present limits of the Louisiana-Texas province have been only apparently defined, and it is possible that the area may be extended landward as well as out into the Gulf of Mexico.

"These subsurface masses, known as salt domes, consist essentially of deep-seated, subcircular, corelike masses of salt which have been intruded into the overlying beds and mantle rock, normally bowing them upward into dome or mound-shaped, usually subsurface, structures. The structures are usually circular or elliptical in plan, although at times irregular in outline, and their diameters may vary from a fractional part of a mile to more than two miles.[2]

"The core of a salt dome is composed essentially of the mineral, halite (NaCl), which may be 99.4% pure, although streaks of anhydrite occur often as impurities. The thickness of the salt core has never been determined, but it is definitely known that it may be measured in thousands if not tens of thousands of feet.

"The salt core may or may not be topped with a cap, from a few feet to several hundred feet in thickness, consisting of various minerals or combinations of minerals, such as limestone, gypsum, anhydrite, calcite, sulfur, galena, sphalerite, pyrite, petroleum, etc., the first four minerals constituting the essentials, the others the accessory minerals.

"It is not true, however, that all intruded salt masses express themselves topographically at the surface; on the contrary, the majority of them have no surface expression whatsoever; a few have surficially manifested themselves by sunken areas. The absence of a surface expression has been the motivating reason for the rapid development of a new science which may not only detect but measure and determine the shape, size, and location of these masses even though they may be buried under thousands of feet of sediment and water."[2]

Those coastal salt domes, which are reflected as topographic highs, are covered mainly with brownish-yellow loam, but in places, notably in the sharp gullies, sections of clays, sands, gravels, and sandy clays are exposed. On the northern part of Avery Island occur numerous outcrops of variegated chocolate, green, and yellow jointed clays. On this same island, underlying an 18-foot lignite bed is a thick clay stratum (85 feet). Unfortunately, many of the clays carry admixtures of lime and gypsum, but where these are absent the clays are suitable for brickmaking and rough pottery. To the writer's knowledge, no attempts have been made to utilize the clays below the lignite, but in older formations, such as the Wilcox, shales found interbedded with lignite are semi-refractory and are suitable for fire clays, pottery clays, and brick clays. Near New Iberia, clays mapped as the Red River formation along the Bayou Teche until recently were extensively used for the manufacture of brick.

Hanna and Wolf,[3] in making up a catalogue of minerals known to have been found associated with the cap rocks of salt domes of Texas and Louisiana, have listed the following minerals:

Anhydrite ($CaSO_4$)	Marcasite (FeS_2)
Gypsum ($CaSO_4$, $2H_2O$) (var. gypsum, selenite, satin spar, alabaster, massive, oölitic)	Galena (PbS)
	Hauerite (MnS_2)
	Alabandite (MnS)
	Realgar (As_2S_2)
Barite ($BaSO_4$)	Chalcopyrite ($CuFeS_2$)
Celestite ($CaSO_4$)	Chalcocite (Cu_2S)
Calcite ($CaCO_3$) (var. calcite, limestone)	Enargite (Cu_3AsS_4)
	Halite (NaCl)
Aragonite ($CaCO_3$)	Quartz (SiO_2)
Strontianite ($SrCO_3$)	Hematite (Fe_2O_3)
Smithsonite ($ZnCO_3$)	Sulfur (S)
Dolomite ($CaMg(CO_3)_2$)	Arsenic (As)
Pyrite (FeS_2)	Sphalerite (ZnS)

The interior salt domes of Louisiana, such as Vacherie, Prothro, Bistineau, Kings, Rayburn, Price, Drake, Winnfield, Cedar Creek, and Coochie Brake, have surface exposures of clays of the Midway, the Wilcox, and the Claiborne ages, which, when not too sandy or too greatly mixed

[1] R. A. Steinmayer, "Salt Domes of the United States," *Trans. Amer. Inst. Chem. Eng.*, **25**, 240–46 (1930).
See also story of Avery Rock Salt Mine, *Bull. Amer. Ceram. Soc.*, **16** [9] 381–83 (1937).

[2] R. A. Steinmayer, "Salt Domes—the Impetus to Geophysical Prospecting," *Trans. Electrochem. Soc.*, **67**, 37–50 (1934).

[3] M. A. Hanna and A. G. Wolf, "Texas and Louisiana Salt Dome Cap-Rock Minerals," *Bull. Amer. Assn. of Petrol. Geol.*, **18** [2] 212–25 (1934).

with lime and gypsum, should be suitable for brick, pottery, fire, and stoneware clays.

It may still be in the realm of legitimate speculation to presume that, in addition to mining salt from the core of domes, extracting sulfur from their cap rocks, and pumping oil from their flank beds and cap rocks, man some day may also utilize the deposits at the surface and within the cap rock and core of the salt domes for the manufacture of ceramic products. But then, too, only the more daring visualized a decade ago that plants would ever be erected on the domes to manufacture by-products of salt. Today, however, the salt-cake and soda-ash by-products, also used extensively by the ceramic industry, are important industries in our States. The ceramic deposits are on the salt domes; man needs but to utilize them.

Tulane University of Louisiana
New Orleans, Louisiana

THE TEXAS CERAMIC INDUSTRY*

By E. P. Schoch and David McKnight, Jr.

Abstract

Ceramic products of Texas consist almost entirely of brick, tile, and sewer pipe, although materials suitable for a good many other types of ware are available. The presence of plentiful raw materials, as well as the availability of cheap fuel, combined with the rapid growth in population and industrial activity in this section, should result in a rapid expansion of the ceramic industry in the immediate future. The need for cöoperative effort in the industry is pointed out. This effort should be directed to the development of new products which will extend the applicability of clayware, particularly in the building trade.

I. Introduction

The ceramic industry of Texas is confined chiefly to the manufacture of heavy clay products. There are a few old potteries making stoneware and novelty pottery and a plant or two making glazed tile, but the output of these plants is negligible in volume and value as compared to that of the brick, tile, and sewer-pipe plants. There are some indications, however, that a notable expansion of the stoneware industry and even a beginning of a whiteware industry are in prospect. There is also ample reason to expect a further expansion of the heavy clayware industries.

There is no dearth of raw materials; clay suitable for almost any type of ware is available within the State. The only notable deficiencies are in the clays suitable for high-grade fire brick and for use as ball clay. The fine clayware industry is accustomed to ship its ball clay some distance to its plants so that this lack is not a material obstacle to the establishment of such industries in this region. The abundant supply of cheap fuel, the favorable labor situation as compared to that in the older centers of the clayware industry, and the rapidly expanding market are all factors which can be expected to encourage a significant growth in the Texas ceramic industry.

II. Clay-Bearing Formations

(1) Wilcox

The most important clay-bearing formation of this region is the Wilcox formation of the Eocene, which outcrops in a long band, entering Texas at the northeast corner and proceeding in a generally southwest direction until it crosses the Rio Grande below Eagle Pass. This formation contains lenticular deposits of some excellent brick, tile, and stoneware clays.

(2) North Texas

Another important source of clays, usually red-firing, is found in the Pennsylvanian outcrops of northwest Texas. The Eagle Ford shales of the Cretaceous in north Texas yield some highly plastic brick clays, somewhat calcareous in some localities. Isolated clay beds in other formations in some instances contain valuable raw materials for clayware industries. Alluvial river-bed clays are worked for common brick at several places.

---

* Presented at the Fortieth Annual Meeting, American Ceramic Society, New Orleans, La., March 28, 1938 (General Session on Ceramic Resources of the Southern States). Received February 10, 1938.

III. Clay Surveys Made

No comprehensive survey of the clays of Texas has ever been made. In 1903, Heinrich Ries made a survey of the eastern portion of the State, but his work, while carefully and capably done, was hampered by lack of time and funds and can not be said to have been an exhaustive survey even of the limited region which he covered. Ries' observations were published in the *University of Texas Bulletin*, No. 102 of 1908, and later abstracted in a book.[1] A great deal of material from Ries' *Bulletin*, including all of his analytical and test data, was reprinted in a later *University Bulletin*.[2]

NOTE: This publication also contains the results of tests of a number of clays which had been studied by the Bureau of Industrial Chemistry during several years prior to 1931. Unfortunately, all of the data of this nature were not available for publication. A fire which destroyed the Chemistry Building at the University also destroyed a considerable amount of data that were to have been included in this *Bulletin*.

Sellards[3] gives a brief account of clays in the State, chiefly from a geological point of view.

IV. Kaolins

There are two occurrences of recognized kaolins in Texas. One is in Real County and the other in Jeff Davis County, both in west Texas and both, particularly the latter, rather far removed from centers of population. The Real County kaolin has been shown to be capable of being washed to yield a high-grade material. There also occurs in conjunction with it a clay which might be used for high-grade refractory ware. The total amount of both materials available, however, is not great.[4]

In the case of the Jeff Davis County kaolin, no information as to the probable extent of the deposit is available, but the clay has been shown to fire to a pure white and to be fairly highly refractory. The presence of these kaolins in the State, even though at remote points, makes it appear reasonable that a whiteware plant could be operated at some point at which it could take advantage of cheap fuel and the important markets of the eastern portion of the State. Such a plant could obtain feldspar from within the State but would have to ship its ball clay in from a greater distance.

V. Fire Clays

No high-grade fire clays have ever been found in Texas, but several localities produce fire brick of sufficient refractoriness for many purposes. Elgin, in central Texas, Athens, in east Texas, and Sulphur Springs, in northeast Texas, are examples.

There is an abundance of highly plastic buff-firing clay, particularly in the Wilcox formation, and this should prove valuable for stoneware. Its possibilities in this connection have already been realized to some extent, as in the old potteries at Athens and in the San Antonio vicinity, but not nearly so extensively as might be expected.

VI. Slip Clay

Ries found one clay near San Antonio which he considered to be of possible value as a slip clay, but it has never been developed.

VII. Volcanic Ash

An interesting deposit of what appears to be an altered volcanic ash occurs in Brazos and Washington counties, and possibly at other points farther east. This material contains a considerable amount of the alkalis, and Sellards[5] suggests that it might be used as a slip clay or as a self-fluxing china clay. The samples from this vicinity, however, which have been examined in this laboratory, do not appear to offer much promise for the latter use. Some were utterly devoid of plasticity, while others were quite plastic. The latter exhibit an excessive drying shrinkage and also fire to a rather unpleasing dirty buff. All of them would appear to require a substantial admixture of other ingredients to produce a satisfactory body, and this would defeat their usefulness as self-fluxing clays. But the deposit seems to vary considerably in properties at different points, and it is not inconceivable that at some point a quantity of material with favorable properties might be found.

VIII. Bentonite

In line with altered volcanic ash, there are plentiful deposits of distinctly bentonitic clays at several places in the State. Such clays in Fayette and adjoining counties in the Coastal Plain have already been worked to some extent to yield raw

---

[1] Heinrich Ries, Clays, Their Occurrence, Properties, and Uses. John Wiley & Sons, New York, 1927.

[2] A. D. Potter and David McKnight, Jr., "Clays and the Ceramic Industries of Texas," *Univ. of Texas Bull.*, No. 3120 (1931).

[3] E. H. Sellards, "Geology of Texas," *ibid.*, **2**, No. 3401 (1934); p. 277 *et seq.*

[4] See *Univ. of Texas Bull.*, No. 3120, p. 140.

[5] *Univ. of Texas Bull.*, No. 3401, p. 289.

material for acid-treated clays used in oil refining. There are other deposits near San Antonio and another near Laredo. Extensive deposits are found in far west Texas, in the Chisos Mountains of Brewster County.

Some of these bentonites might prove of value in ceramic mixtures. All of them, when fired alone, give a rather deep color, but their plasticizing property is so strong that very small proportions, such as to produce no undesirable color effects in the mixture, might suffice to lend plasticity to other clays. Their high content of fluxing ingredients might also prove useful in such mixtures.

IX. Fuller's Earth

Bentonite and fuller's earth are the only clays sold as such in Texas in sufficient volume to constitute an important industry. Fayette County and vicinity provide most of the bentonite used for the production of acid-treated clays for the decolorization of oil. Walker and Bexar counties are the centers of fuller's earth production.

X. Production Statistics

The Bureau of Mines statistics[6] for recent years show the amounts of such clays produced for market in Texas in recent years, and from these figures the following tabulation is compiled. Statistics for fire clay and stoneware clay are also given and are included here.

Year	1934	1935	1936
Fireclay and stoneware clay production			
Volume	19,907 tons	7,146 tons	6,394 tons
Value	$38,694	$24,486	$57,171
Proportion which Texas production bears to total U. S. production	1.48%	0.37%	0.27%
Bentonite production			
Volume	35,248 tons	39,391 tons	22,647 tons
Value	$235,194	$237,123	$154,216
Proportion of total U. S. production	16.36%	20.55%	11.52%
Fuller's earth production			
Volume	32,763 tons	40,925 tons	46,855 tons
Value	$325,397	$391,641	$462,656
Proportion of total U. S. production	14.66%	18.00%	19.7%

XI. Structural Clay Industries

The heavy clayware industries have long been well established in the State. There are two plants making sewer pipe and other salt-glazed ware, one at San Antonio and one at Texarkana. According to figures compiled in 1930, there were forty-three brick and tile plants operating in the State. No data are available as to how many are now operating. It is known that several new plants have gone in during the past few years, but a few have closed, and the net increase in number and capacity can not now be stated. The increase in capacity has been quite substantial.

The entire State has seen a great deal of building activity recently, both in public buildings and private residences. The former field has naturally consumed a substantial quantity of products of the brick and tile industry, and the latter has probably consumed more of them in proportion than in former years. The mild climate has always tended to encourage cheap frame residential construction in many parts of Texas, but in recent years there has been a trend toward more permanent types of building materials. Use of brick and tile construction has increased materially, although there is still a prejudice, largely an economic one, against all-masonry construction. The great majority of brick residences are only brick veneer. It would appear that the brick industry could profitably spend a little money and effort in educating the public to the advantages of tile and brick construction.

XII. Texas Clay Institute

The clay industry of Texas has always been somewhat handicapped by a lack of coöperation between its members. It is encouraging to note that a greater spirit of coöperation is being shown at the present time. The formation of the Texas Clay Institute, composed of fourteen manufacturing companies, is a promising step. It is to be hoped that the Institute will not confine its

[6] U. S. Bureau of Mines, Minerals Yearbook, 1937, p. 1255.

activities, as some trade associations tend to do, to reducing competition among its members, but will devote itself to widening the field of application for clay products.

XIII. Building Trends

There is an increased interest in novel methods of house building. The prefabricated house, steel-frame construction, and other departures from established building practice are coming more and more to the front. While such methods of construction have not yet assumed such proportions in practice as to affect materially the building trade, the popular interest in them and the reasonable basis for them will probably result in some substantial modification of present practices. Thus far the brick industry, certainly in this territory, has not been active in developing materials and methods to compete with those being developed in other industries. Here is a promising field of endeavor for the combined forces of the Texas clay industries. The problem of the most practical method of construction for Texas should not have to be solved elsewhere, because the problem here is not the same as in other regions. Down here, more emphasis should be placed on plenty of window space and on provision for houses more readily cooled in the summer rather than more readily warmed in the winter. The dry regions of Texas need a house different in many respects from the house most practical in the more humid coastal sections.

In planning much of the residential construction in the past, there has been an unbelievable disregard for consideration of adaptability to climatic conditions. Houses have been planned according to current fads, such as Cape Cod cottages, California bungalows, and various other creations, according to fashions developed in other climates and to meet different conditions. Industries engaged in supplying building materials can do much to educate the public to more practical home design.

The increasing possibility of air conditioning for private homes is going to bring problems of insulation and air-tightness which heretofore have not been considered in this country. The clayware industry should be in the forefront in the development of building materials and methods to meet these conditions, and there is no reason why the industry in this part of the country should not work out its own problems and take an aggressive stand in defending and extending its place in the building materials trade.

XIV. Ceramics at University of Texas

Some years ago the University of Texas, through the Bureau of Industrial Chemistry, set out to work for the advancement of the clayware industries of the State. A man was added to the staff for this purpose, and a substantial portion of the Bureau's resources was devoted to this work. The Bureau has been consulted frequently by land owners who had clay deposits and wanted to know whether brick could be made from their clay; this is about the extent of the work that has been done. The support necessary to go out into the State in an active campaign to cultivate these clay resources has not been available. The clayware industry has neither supported this work nor even availed itself of the services of the University. Inasmuch as there are other industries in which a different attitude is found and other lines of work which are demanding attention, this department has decided to give up the ceramic work. The fact that the work has not been carried on as the writers wished it to be in this field has not proved that there is no need for this work. On the contrary, it is believed that the clayware industry, in common with all of the industries of Texas, needs a great deal of constructive research effort expended in its behalf, if it is to attain a secure and important position in our business life.

The attitude of the members of clayware industry in the past has appeared to be that the only effect of research will be to invite competition. They have availed themselves of improvements in brickmaking machinery, developed by the machinery manufacturers, but, in general, they have gone on making the same products in the same way they always have. This attitude is suggestive of that of the man with the little weed-grown fishing pond. He said that he did not catch many fish in it, but he knew that if he cleaned out the weeds and built his dam higher other people would want to fish there, and he preferred to have his little pond with the few small fish to himself. That was all right as far as it went, but the first thing he knew someone else had build a big dam upstream and ruined his pond completely. That is the way with most industries that fear the effect of changes and advances. Before they know it some other industry or some other region has drowned them out.

The authors are advocating the establishment of a research institute to serve the peculiar needs of Texas and the adjoining territory. Such an institute probably should not be entirely State-supported, but should be supported by the joint resources of the public and of the industries interested. The purpose of such an institute would be to develop new products, improve old products, reduce waste in production, and, in general, work for the advancement of local industries for the public welfare. There are excellent examples for such an institute in the Mellon Institute, the Battelle Memorial Institute, and others. Why are these established organizations not adequate to serve us? Because they are far removed from us, geographically and otherwise.

If it becomes cheaper to build a modern house with steel and glass than to build it with brick and tile, the locally owned brick and tile plants will have to shut down. This is no idle pipe dream. It is a real possibility and a challenge to the initiative and industry of a people who are not so far removed from the days of the frontier as to have lost all desire to drive ahead and win for themselves greater security and comfort.

Bureau of Industrial Chemistry
The University of Texas
Austin, Texas

COMMUNICATIONS—CERAMIC HISTORY

CHARLES L. ALLEN

Mr. Allen is one of the founders of Norton Company which was incorporated in 1885. The founders included Milton P. Higgins, first president; George I. Alden, first treasurer; Mr. Allen, first general manager; and John Jeppson, superintendent. Mr. Allen held the position of general manager of the Company from 1885 to 1933. He became a member of the board of directors in 1892, was secretary from 1892 to 1912, treasurer from 1912 to 1919, president from 1919 to 1933, and chairman of the board of directors since 1933.

Soon after Mr. Allen became general manager, preparations were begun to build a plant at Barbers Crossing in the northerly section of Worcester known as Greendale, and the business moved to that location in 1886. Under his management and wise counsel, the demand for Norton products soon exceeded the new plant's capacity, and today there is a group of buildings a mile long from one end to the other containing manufacturing floor space of nearly two and one-quarter million square feet. During Mr. Allen's management, Norton plants were erected in Bauxite, Ark.; Niagara Falls, N. Y.; Chippawa, Ontario, Canada; Hamilton, Ontario, Canada; Wesseling, Germany; Welwyn Garden City, England; La Courneuve, France; and Corsica, Italy.

In addition to these plants, affiliated with the Norton Company now are the Behr-Manning Corp., of Troy, N. Y., and the Norton Pike Co., of Littleton, N. H.

While the principal product has always been grinding wheels, the Norton plants produce abrasive products of nearly every type used in industry, *viz.*, grinding machinery and refractories.

Charles L. Allen has always held himself ready to answer the variety of calls which are bound to come from a community to one who is able and willing to respond to them. In his native city, he is well known for his activities in the city development, particularly of its institutions. Perhaps the one outstanding Worcester institution which exists only because of Mr. Allen's untiring efforts is the Worcester Memorial Auditorium, which was conceived, erected, and dedicated by the Worcester Municipal Memorial Auditorium Commission of which he was the chairman.

Going back many years, he will be remembered as chairman of a comittee that promoted and built Worcester's leading hotel, the Bancroft. He will be remembered also for his work on committees which had to do with the financing and building of such institutions as the Worcester Boy's Club, the Worcester Y.M.C.A., and in connection with many drives for war funds between 1914 and 1918. He was one of the founders of the Worcester Community Chest and has been a member of the General Committee which has handled the Golden Rule Fund since its inception. Mr. Allen's exceptional generosity toward Worcester's charities and institutions is notable.

In addition to directing the affairs of the Norton Company, he has been associated with other institutions, including the Indian Hill Co., Riley Stoker Corp., Worcester County Trust Co., Bancroft Realty Co., Worcester Merchants Mutual Insurance Co., Worcester Five Cents Savings Bank, Liberty Mutual Insurance Co. of Boston, and Junior Achievement, Inc., of Springfield. His counsel has been claimed by the Old Men's Home and by the Worcester Polytechnic Institute. He is a Trustee of the latter and a member of the Executive Committee.

Among the business and professional organizations in which he has been interested and served in past years are the New England Council, Worcester County Farm Bureau, Eastern States League, Massachusetts Committee of Public Safety, Worcester Committee of Public Safety, New England Farm and Food Foundation, Business Historical Society of Boston, National Economic League, American Museum of Natural History, and Worcester County Musical Association.

In fraternal circles and social clubs, he is honored as a

Thirty-Second Degree Mason and holds membership in the Worcester Club, Petersham Country Club, Watatic Club, Worcester Country Club, Tatnuck Country Club, Worcester County Fish & Game Association, National Geographic Society, American Red Cross, and Worcester Commercial Travelers.

During President Coolidge's administration, Mr. Allen was nationally recognized by appointment to the Hoover Commission upon the St. Lawrence Waterways.

In 1931, he was honored by King Gustave V of Sweden through the Swedish Consul General, Olaf H. Lamm, when he was decorated Knight of the First Class, Order of Vasa.

Many years ago, he served four years as a member of Company C, Worcester Light Infantry, Second Regiment, and he is still a member of the Veteran's Association.

Full name: Charles Lucius Allen
Address: 6 Academy Street, Worcester, Mass.
Date of birth: March 6, 1858
Birthplace: Worcester, Mass.
Names of parents: George Lucius Allen, Aliza Jane Black
Name of wife: Helen Louise Norton (deceased)
Children: Mary Norton Allen
Education: Worcester Public Schools, High School 1876

He started his business career as a clerk in a retail shoe store in 1877. From 1879 to 1880, he was a clerk in the Boston & Maine Railroad office. In 1881, he became bookkeeper for F. B. Norton Pottery Works. In 1885, he became general manager of the Norton Emery Wheel Company, the name of which was later changed to Norton Company.

There is probably no complete record of the local and national organizations to which Mr. Allen has given counsel and service.

Mr. Allen has always exemplified a spirit of devotion to high standards of quality, service, ethics, and progress. In his character, the qualities of kindness, consideration, and loyalty have been outstanding. On his eightieth birthday, the directors of the Norton Company commemorated the occasion by presenting to Mr. Allen a bronze plaque bearing his likeness and by distributing to friends and employees bronze medals reproduced from the plaque.

The Norton Company shop newspaper, *The Norton Spirit*, contained a feature article with illustrations of the Charles L. Allen Petersham Camp where many Norton groups have been entertained on various occasions. Ten years ago, on the occasion of Mr. Allen's seventieth birthday, a special issue of *The Norton Spirit* was published, devoted exclusively to historical facts and social activities of this friend of all Norton men and women.

Additional Facts

The emery-wheel business was started in the pottery shop of F. B. Norton on Water Street, Worcester. In 1873, experimentation began in an effort to produce an emery wheel by the vitrifying process, using a clay bond. In 1879, manufacturing began on a small scale, but little progress was made in the development of the grinding-wheel business until 1885 when the Norton Emery Wheel Company was incorporated. For "History of Norton Company," see *Bull. Amer. Ceram. Soc.*, **15** [8] 295 (1936).

ACTIVITIES OF THE SOCIETY

ASSOCIATION OF CERAMIC EDUCATORS

Minutes of Meeting

The Association of Ceramic Educators held a meeting in New Orleans, La., March 27, 1938. The minutes of the meeting are presented as follows:

The members of the Association of Ceramic Educators present were W. H. Vaughan, J. W. Whittemore, C. W. Parmelee, W. R. Morgan, C. M. Dodd, M. E. Holmes, S. R. Scholes, F. H. Norton, Robert Stone, A. V. Henry, N. W. Taylor, Lane Mitchell, A. I. Andrews, A. S. Watts, A. F. Greaves-Walker, R. K. Hursh, Paul E. Cox, P. G. Herold, W. Weyl, J. F. McMahon, C. W. Merritt, E. C. Henry, T. N. McVay, and C. R. Amberg.

A. S. Watts, *President*, proposed that all curricula studies be brought up to date as of October 1, 1938. It was moved, seconded, and carried that a new table of curricula be prepared as of October 1, 1938.

M. E. Holmes suggested that this table be of the same form as the original table published in the March, 1938, *Bulletin*.

S. R. Scholes moved that the initials of the various schools be substituted for numbers in reports of ceramic engineering curricula. It was amended that this information be made available to the ceramic educators and that the material be published as before. Carried.

It was moved by C. W. Parmelee and seconded by C. M. Dodd that a summary report be prepared by the Secretary and the President's committee for S.P.E.E. Carried.

It was moved that the Chair appoint chairmen of committees and that these chairmen select two other members to study the wide variations in the chemistry, English, mechanics, drawing, surveying, fuels, and mathematics contents of the various ceramic engineering curricula. Carried.

J. L. Carruthers' report on S.P.E.E. and Ceramic Educators was read. It was moved that this report be sent to S.P.E.E. Carried.

A. F. Greaves-Walker reported on the affiliation of the Association of Ceramic Educators with the American Ceramic Society. This has been changed to the Ceramic Education Council and such affiliation was approved by the Board of Trustees. This is to be made final after a set of rules has been approved by the Board of Trustees.

It was moved that the Chair appoint a Rules Committee.

Carried. This Committee is S. R. Scholes, C. R. Amberg, and J. W. Whittemore.

A. S. Watts was elected to serve as a member of the Board of Trustees of the American Ceramic Society as representative for the Ceramic Educational Council.

The report of C. W. Parmelee on contents of ceramic courses was presented as a table by W. R. Morgan. After considerable discussion, it was moved that a committee be appointed to study the problem of unit courses and revision of courses and prepare a preliminary report.

It was moved by C. M. Dodd and seconded by N. W. Taylor that the present committee be retained and expanded as much as necessary. Carried.

It was moved that this Committee cover the entire field, including those committees which were to study separate phases of the ceramic curricula, and that C. W. Parmelee be made chairman of the Educational Committee with power to expand this Committee. Carried.

It was moved that a definite request be made to the Fellows of the American Ceramic Society for funds to carry on this work.

NOTE: A request for $50.00 was made, and this was granted.

Officers of the Association of Ceramic Educators elected are as follows:

President: J. W. WHITTEMORE, Virginia Polytechnic Inst., Blacksburg, Va.

Secretary: T. N. MCVAY, Univ. of Alabama, University, Ala.

Committee A, American Ceramic Society: A. V. HENRY, Georgia School of Technology, Atlanta, Ga.

Committee B, American Ceramic Society: C. M. DODD, Missouri School of Mines, Rolla, Mo.

—T. N. MCVAY, *Secretary*

CERAMIC EDUCATIONAL COUNCIL

The personnel of the Ceramic Educational Council, formerly the Association of Ceramic Educators, is as follows: C. R. Amberg, A. I. Andrews, G. H. Brown, R. M. Campbell, J. L. Carruthers, P. E. Cox, P. S. Dear, C. M. Dodd, A. F. Greaves-Walker, A. V. Henry, E. C. Henry, M. E. Holmes, R. K. Hursh, J. R. Kauffman, R. M. King, J. F. McMahon, T. N. McVay, C. W. Merritt, Lane Mitchell, F. H. Norton, S. R. Scholes, Robert Stone, N. W. Taylor, A. S. Watts, W. Weyl, J. W. Whittemore, and W. H. Vaughan.

The following committees have been appointed for the year 1938–1939:

Committee for Study of Course Distribution of the Subjects in Ceramic Engineering Curricula at the Various Schools

M. E. HOLMES, *Chairman:* N. Y. State College of Ceramics, Alfred, N. Y.

A. F. GREAVES-WALKER: Univ. of North Carolina, Raleigh, N. C.

N. W. TAYLOR: Pennsylvania State College, State College, Pa.

F. H. NORTON: Massachusetts Inst. of Technology, Cambridge, Mass.

Committee on Rules

S. R. SCHOLES, *Chairman:* New York State College of Ceramics, Alfred, N. Y.

C. R. AMBERG: Alfred, N. Y.

J. W. WHITTEMORE: Virginia Polytechnic Inst., Blacksburg, Va.

Committee for Study of Contents of Ceramic Courses Included in the Various Ceramic Engineering Curricula

C. W. PARMELEE, *Chairman:* Univ. of Illinois, Urbana, Ill.

W. R. MORGAN: Univ. of Illinois, Urbana, Ill.

T. N. MCVAY: Univ. of Alabama, University, Ala.

Committee for Studying the Wide Variation in the Chemistry Content of the Various Ceramic Engineering Curricula

N. W. Taylor, *Chairman:*

E. C. Henry: Pennsylvania State College, State College, Pa.

T. N. MCVAY

Committee for Studying the Wide Variation in the Drawing Content of the Various Ceramic Engineering Curricula

A. V. HENRY, *Chairman:* Georgia School of Technology, Atlanta, Ga.

LANE MITCHELL: Georgia School of Technology, Atlanta, Ga.

J. F. MCMAHON: N. Y. State College of Ceramics, Alfred, N. Y.

Committee for Studying the Wide Variation in the Surveying Content of the Various Ceramic Engineering Curricula

A. F. GREAVES-WALKER, *Chairman*

P. E. COX: Iowa State College, Ames, Iowa

R. L. STONE: Univ. of North Carolina, Raleigh, N. C.

Committee for Studying the Wide Variation in the Fuels Content of the Various Ceramic Engineering Curricula

R. K. HURSH, *Chairman:* Univ. of Illinois, Urbana, Ill.

W. R. MORGAN

F. H. NORTON

Committee for Studying the Wide Variation in the Mathematics Content of the Various Ceramic Engineering Curricula

C. R. AMBERG, *Chairman*

C. W. MERRITT: N. Y. State College of Ceramics, Alfred, N. Y.

W. WEYL: Pennsylvania State College, State College, Pa.

Committee for Studying the Wide Variation in the Mechanics Content of the Various Ceramic Engineering Curricula

J. L. CARRUTHERS, *Chairman:* Ohio State Univ., Columbus, Ohio

R. M. KING: Ohio State Univ., Columbus, Ohio

R. K. HURSH

Committee for Studying the Wide Variation in the English Content of the Various Ceramic Engineering Curricula

C. M. DODD, *Chairman*

P. G. HEROLD: Missouri School of Mines, Rolla, Mo.

A. S. WATTS: Ohio State Univ., Columbus, Ohio

—J. W. WHITTEMORE, *President, Ceramic Educational Council*

INSTITUTE OF CERAMIC ENGINEERS, OFFICERS, 1938-1939

President: A. F. GREAVES-WALKER, Univ. of North Carolina, Raleigh, N. C.

Vice-President: J. L. CARRUTHERS, Ohio State Univ., Columbus, Ohio.
Honorary Past-President: F. L. STEINHOFF, *Brick & Clay Record*, 59 E. Van Buren St., Chicago, Ill.
Secretary: C. M. DODD, Missouri School of Mines, Rolla, Mo.
Treasurer } R. E. BIRCH, Harbison-Walker
Trustee Representative } Refractories Co., Pittsburgh, Pa.
Nominating Committee A: H. N. BAUMANN, JR., Carborundum Co., Niagara Falls, N. Y.
Nominating Committee B: S. J. MCDOWELL, General Ceramics Co., Keasbey, N. J.

INSTITUTE OF CERAMIC ENGINEERS

Application Blanks Available

Application blanks for membership in the Institute of Ceramic Engineers are ready for mailing. Members of the Society who hold engineering degrees are eligible. Members holding science degrees who have been engaged in engineering work may also be eligible.

If interested, write to R. C. Purdy, General Secretary, 2525 North High St., Columbus, Ohio, for an application blank. Fill it out and return to the Chairman of the Committee on Membership and Examination, A. S. Watts, Ohio State Univ., Columbus, Ohio.

—A. F. GREAVES-WALKER, *President*
C. M. DODD, *Secretary*

INSTITUTE OF CERAMIC ENGINEERS COMMITTEES

The following persons have been appointed to serve on the Committees of the Institute of Ceramic Engineers for the year 1938–1939:

Committee on Rules

H. G. WOLFRAM, *Chairman:* Porcelain Enamel & Mfg. Co., Baltimore, Md.
W. KEITH MCAFEE: Universal Sanitary Mfg. Co., New Castle, Pa.
S. J. MCDOWELL: General Ceramics Co., Keasbey, N. J.

Committee on Membership and Examinations

A. S. WATTS, *Chairman:* Ohio State Univ., Columbus, Ohio
H. M. KRANER: Bethlehem Steel Co., Bethlehem, Pa.
ROBERT TWELLS: Electric Auto-Lite Co., Fostoria, Ohio
H. N. BAUMANN, JR.: Carborundum Co., Niagara Falls, N. Y.
T. A. KLINEFELTER: National Bureau of Standards, Washington, D. C.

Committee on Ceramic Engineering Education

E. H. FRITZ, *Chairman:* Westinghouse Electric & Mfg. Co., Derry, Pa.
R. M. CAMPBELL: N. Y. State College of Ceramics, Alfred, N. Y.
J. W. WHITTEMORE: Virginia Polytechnic Inst., Blacksburg, Va.
H. T. COSS: Johns-Manville Corp., Manville, N. J.
J. M. MCKINLEY: North American Refractories Co., Cleveland, Ohio

Committee on Professional Status and Development

R. S. BRADLEY, *Chairman:* A. P. Green Fire Brick Co., Mexico, Mo.
L. J. TROSTEL: General Refractories Co., Baltimore, Md.
A. T. MALM: Norton Co., Worcester, Mass.

Committee on State Boards of Engineering Examiners

This Committee is composed of the following Assistant Secretaries:

W. H. VAUGHAN, *Chairman:* Georgia School of Technology, Atlanta, Ga.
R. M. KING: Ohio State Univ., Columbus, Ohio
H. B. DUBOIS: Consolidated Feldspar Corp., Trenton, N. J.
T. N. MCVAY: Univ. of Alabama, University, Ala.
P. E. COX: Iowa State College, Ames, Iowa
W. D. BOZMAN: Denver Pressed Brick Co., Loveland, Colo.
HEWITT WILSON: Univ. of Washington, Seattle, Wash.

—A. F. GREAVES-WALKER, *President*,
Institute of Ceramic Engineers

COMMITTEE APPOINTMENTS OF THE FELLOWS OF THE AMERICAN CERAMIC SOCIETY

Executive Committee

Dean: P. E. COX, Dept. of Ceramic Engineering, Iowa State College, Ames, Iowa
Associate Dean: W. K. MCAFEE, Universal Sanitary Manufacturing Co., New Castle, Pa.
Secretary-Treasurer: R. K. HURSH, Dept. of Ceramic Engineering, Univ. of Illinois, Urbana, Ill.
Past-Dean: E. P. POSTE, 309 McCallie Ave., Chattanooga, Tenn.

Nominating Committee "A"

Chairman: B. T. SWEELY, Chicago Vitreous Enamel Products Co., 1407 S. 55th Court, Cicero, Ill.
D. F. ALBERY, Edward Orton, Jr., Ceramic Foundation, Columbus, Ohio
A. P. POTTS, 118 E. Blaine, Brazil, Ind.

Nominating Committee "B"

Chairman: H. M. KRANER, Bethlehem Steel Co., Bethlehem, Pa.
J. F. KREHBIEL, Accurate Pyrometric Cone Co., Pataskala, Ohio
R. F. GELLER, National Bureau of Standards, Washington, D. C.

Committee on Activities

Chairman: F. H. NORTON, Massachusetts Inst. of Technology, Cambridge, Mass.
G. A. BOLE, Ohio State Univ., Engineering Experiment Station, Columbus, Ohio
A. E. R. WESTMAN, Ontario Research Laboratory, Toronto, Ontario, Canada
H. G. SCHURECHT, N. Y. State College of Ceramics, Alfred, N. Y.
HEWITT WILSON, Dept. of Ceramic Engineering, Univ. of Washington, Seattle, Wash.
G. V. MCCAULEY, Corning Glass Works, Corning, N. Y.

Committee on Honorary Membership

Chairman: ALEXANDER SILVERMAN, Dept. of Chemistry, Univ. of Pittsburgh, Pittsburgh, Pa.

LOUIS NAVIAS, Research Lab., General Electric Co., Schenectady, N. Y.

EDWARD SCHRAMM, Onondaga Pottery Co., Syracuse, N. Y.

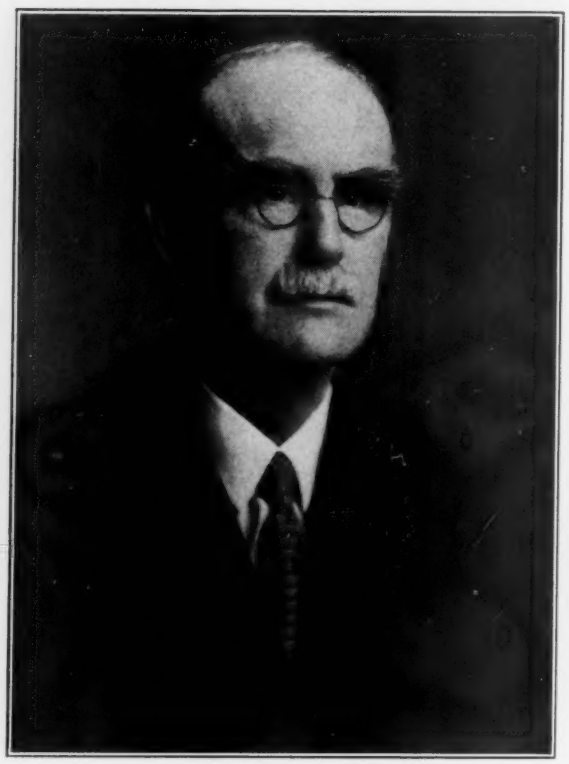
Committee on Activities

The Committee on Activities will have the task of considering any publication work for which funds are requested of the Fellows. It will be a part of the work of this Committee to make an analysis of the purposes and values of the Fellows organization and to propose proper tasks and suggest methods of financing such work.

—PAUL E. COX, *Dean*

CHARLES W. THOMAS, HONORARY MEMBER

EDITOR'S NOTE: At the Fortieth Annual Meeting of the American Ceramic Society, four persons were elected to Honorary Membership in the Society. Biographies and photographs of three of these Honorary Members appeared in the May issue of the *Bulletin*, *viz.*, Miss M. Louise McLaughlin, Frederick Carder, and Lucien Delloye.



Charles William Thomas

Charles William Thomas, Clifton House, Oldswinford, Stourbridge, England, was elected an Honorary Member of the American Ceramic Society at the Fortieth Annual Meeting of the Society held in New Orleans, La., March, 1938.

Colonel Thomas was educated at King Edward VI's School, Stourbridge, the Leys School, Cambridge, and Mason Science College, Birmingham, now Birmingham University (Engineering and Chemistry).

In 1883, he entered the family business of E. J. & J. Pearson, Ltd., which had been established in 1860. In 1902, he succeeded his father, John William Thomas, as chairman and managing director. The business now comprises six firebrick works and five fireclay mines, and it has the largest output of fireclay refractories in England.

During 1906 and 1907, he was chairman of the Stourbridge Firebrick Association and has also served in the same capacity since 1937. He was chairman of the Stourbridge Fireclay Wages Board during 1913 and 1914 and 1924 to 1935. Since 1921 to the present time, he has served as a member of the South Staffordshire Mines Drainage Commission.

Colonel Thomas has been a member of the English Ceramic Society since 1903 and served as its president for two terms, *viz.*, 1912 to 1913 and 1921 to 1922.

In 1906, he became an associate member of the American Ceramic Society and was elected to active membership in 1923.

During 1934 and 1935, he was president of the National Federation of Clay Industries. He has served as president of the British Refractories Research Association from its commencement in 1920 to the present time.

In 1888, Colonel Thomas was commissioned lieutenant in the Seventh Battalion, the Worcestershire Regiment; he received the Territorial Decoration in 1908; and commanded a Training Battalion of the Worcestershire Regiment during the War, 1914 to 1917.

In a letter to the Secretary of the Society, Colonel Thomas says,

"I suppose that from a ceramic point of view my association with Dr. J. W. Mellor in founding the British Refractories Research Association is probably my most important work.

"The rest of my ceramic activities have been connected directly or indirectly with the refractories industry in my capacity as chairman of E. J. & J. Pearson, Ltd."

CONGRATULATIONS FROM CZECHO-SLOVAK CERAMIC SOCIETY

May 10, 1938

On behalf of the members of the Czechoslovak Ceramic Society, we beg to offer you our heartiest congratulations on the occasion of the Fortieth Anniversary of the founding of your Society. We have always given very close attention to your meritorious activities, which have given us many a suggestion and encouragement. Your decision, some years ago, to arrange a trip to Czechoslovakia was greatly appreciated, and we recollect with pleasure the moments spent in the pleasant company of the members of your Society.

—R. BARTA, *Secretary*,
The Czechoslovak Ceramic Society

A Heap of Living Makes the Home
A Heap of Study and Unremitting Work Brings Success
A Faint Heart Never Achieves
Only He Succeeds Who Determines So to Do

MEMBERSHIP RECORD

Date of Record	Members Paid		Deferred	Subscriptions	Monthly Sales	Total Circulation
	Personal	Corporation				
December 20, 1936	1452	196				
December 22, 1937	1713	220	12	523	220	2688
January 22, 1938	1712	220	12	530	220	2694
February 18, 1938	1728	217	15	540	220	2720
March 18, 1938	1770	216	10	513	220	2729
April 18, 1938	1635	205	60	527	220	2647
May 19, 1938	1643	208	52	548	220	2671

12 New Members in May, only four of whom have paid; these four "paid" new members only are in above totals.

Down 70 personal and 12 corporations since January first

(1) Researches reported in THE JOURNAL are by persons to whom by nature these platitudes are precepts.

(2) Published researches abstracted by our members and published in CERAMIC ABSTRACTS represent collected and concerted determinations to achieve.

(3) THE BULLETIN reports things accomplished by persons who doggedly toil and wish others to share their joy in creating and recording knowledge.

(4) The recorded works of the members of this SOCIETY invite your coöperation.

(5) When many make an organized effort, Happiness and Social Security will be achieved.

—That Is a Heap of Living—

ROSTER CHANGES DURING MAY*

Corporation

GLADDING, MCBEAN & Co., M. F. Johansen (voter), Lincoln, Calif. (San Francisco, Calif.).

Personal

AYDELOTT, ELLIOTT C., 732 Hunter Rd., Glenview, Ill. (Evanston, Ill.)

BOYD, WALTER B., Box 91, Clarkesville, Ga. (Norris, Tenn.)

CHRISTIE, L. D., JR., Metallurgical Dept., American Brake Shoe and Foundry Co., Mahwah, N. J. (Chicago Heights, Ill.)

CROSKEY, CARL D., 8 Glenwood Ave., Catonsville, Md. (Baltimore, Md.)

EHMAN, ROY G., 960 Ninth Ave., Brackenridge, Pa. (Tarentum, Pa.)

HESTER, WESTON T., W. H. Bixby, Inc., 1022 Hubbell Bldg., Des Moines, Ia. (Detroit, Mich.)

KNIGHT, FRANK P., JR., Christmas via Winkelman, Arizona. (Manchester, Mass.)

MANSON, M. E., Rundle Mfg., Co., Milwaukee, Wis. (Cicero, Ill.)

MOULTON, D. A., 2747 Amman St., Pittsburgh, Pa. (Terre Haute, Ind.)

SEELEY, EUGENE L., Roseville, Ohio. (Corning, Iowa)

Student

FOOTE, EARL H., JR., 2717 Weston Ave., Niagara Falls, N. Y. (Medina, Ohio)

NEW MEMBERS

Personal

BETZNER, W. G., Upson-Walton Co., Cleveland, Ohio; special representative.

CORNELIUS, YNGVE R., 395 Mountain View Rd., Englewood, N. J.; consulting engineer.

DERMOTT, W. P., Central of Georgia Railway, 413 W. Liberty St., Savannah, Ga. (Formerly in name of J. M. Mallory.)

GIESEKE, FRANS, Kockums Emaljerverk, Ronneby, Sweden; chemical and research engineer.

GREENWOOD, ROLF W., Dominion Glass Co., Ltd., Wallaceburg, Ontario, Canada; assistant glassmaker.

THORBURN, D. H., United Gas & Fuel Co., Hamilton, Ontario, Canada. (Formerly in name of O. L. Maddux.)

Student

DORN, ALVAH J., New York State College of Ceramics.

KING, CHARLES D., University of North Carolina.

MAUPIN, ADDISON, University of North Carolina.

PACKMAN, WILLARD D., New York State College of Ceramics.

SCHLOFFMAN, JOHN P., Ohio State University.

WARDWELL, WAYNE D., Ohio State University.

WOODWARD, WALDEN F., 614 E. Washington St., Greenville, S. C. (University, Ala.)

*Address in parentheses is the former address.

MEMBERSHIP WORKERS' RECORD

Personal

W. Gieseke	1	W. E. Palmer	1
J. T. Ogden	2		

Student

A. E. Baggs	1	A. F. Greaves-Walker	2
R. M. Campbell	1	M. E. Holmes	1
J. L. Carruthers	1		

Grand Total 10

INDUSTRIAL DIVISIONS

GLASS DIVISION FALL MEETING

The Glass Division of the American Ceramic Society will hold its Tenth Fall Meeting at the Chamberlin Hotel, Old Point Comfort, Va., from September 9 to 12, 1938. A tentative program for the meeting has been planned as follows:

Friday, September 9

Evening: Leave Baltimore at 6:30 P.M., E.S.T., for Old Point Comfort via Old Bay Line steamer.

Saturday, September 10

Morning: Arrive Old Point Comfort for early breakfast.

Meeting: 9:30 A.M. to 12:30 P.M.

Papers: To be announced later. (Time for about three papers.)

Afternoon: Golf, swimming, and Williamsburg trip.

Evening: Informal banquet followed by dancing on the Marine Roof.

Sunday, September 11

Morning: Chemical Analysis Round-Table Discussion, 10:30 A.M. to 12:00 M.

Afternoon: Golf, swimming, lounging.

Evening: Leave Old Point Comfort 7:30 P.M., E.S.T., for Baltimore via Old Bay Line.

Monday, September 12

Morning: Arrive in Baltimore 6:30 A.M.

Breakfast on boat (occupancy until 8:30 A.M., E.S.T.).

Expense Rates for The Chamberlin Hotel and Old Bay Line

Rates include round-trip transportation, Baltimore to Old Point Comfort via Old Bay Line steamer, meals, stateroom, and hotel room. Rates are quoted on double occupancy at the Hotel.

If single occupancy at the Hotel is desired, add $1.00 to the following rates:

Steamer accommodations	Single occupancy	Double occupancy
Outside upper and lower berth-room	$17.50	$15.75
Outside upper and lower berth-room (with shower or toilet)	18.50	16.25
Outside upper and lower berth-room (with tub bath and toilet)	19.50	16.75

Outside double bedroom	$20.00	$17.00
" " " (with toilet)	20.50	17.25
Outside double bedroom (with toilet)	21.00	17.50
Outside double bedroom (with tub bath and toilet or shower bath and toilet)	22.00	18.00
Outside bedroom, double bed and single bed with toilet		18.00
Outside double bedroom with tub bath and toilet	22.50	18.25
Outside twin bedroom with tub bath and toilet	23.00	18.50

NOTE: For those driving their own cars to Baltimore a "Call for and Deliver" garage service is available at the cost of 50 cents per night.

The trip to historic Williamsburg and Yorktown can be arranged at a cost of $3.15 per person, if there are at least 25 in the group. This price covers bus fare and admission to the buildings at Williamsburg.

REFRACTORIES DIVISION FALL MEETING

The Refractories Division of the American Ceramic Society will hold its Fall Meeting at the Bedford Springs Hotel, Bedford, Pa., September 2 and 3, 1938. Friday afternoon, September 2, is reserved for the technical session. The subject and speakers will be announced later.

RICHARD H. PASS MAKES PROPOSAL FOR ART DIVISION*

That aesthetics plays a very real and practical rôle in the ceramic industry is undeniable when one considers how much the industry depends for success on whether the purchasing public is favorably or unfavorably impressed by the appearance of the products of our manufacturers. Public taste is constantly changing, as we all know, and is undoubtedly, in my opinion, susceptible to educational influences.

In short, I think there is an opportunity for the American Ceramic Society to increase its usefulness to the industry by organizing to promote aesthetics in American ceramics. It seems to me that the activity should include not only aesthetics as applied to the production of commercial products by our factories, but also the pure aesthetics of ceramic creations by artists who do not intend them for any utilitarian purpose. In this latter field, as you are probably aware, the Annual Robineau Exhibit of Contemporary Ceramic Art, as organized and sponsored by the Syracuse Museum of Fine Arts, has made a valuable contribution. Mr. Cowan has been very largely responsible for its success.

Mr. Cowan believes that pure aesthetics in ceramics is an important precursor to applied aesthetics in the products of our factories. I agree with him in this opinion and, although no authority on this subject, I believe that it is an important idea to get across to the ceramic industry, or at least to that part of it which is so largely dependent for success on the aesthetic appeal of its products.

Mr. Cowan tells me that some consideration has been given to the formation of a subdivision or committee of the Society for the broad purpose of promoting aesthetics in American ceramics. This would seem to me a good idea and, if the subdivision were well organized, I should think that it would not require necessarily a great deal of time on the part of any one individual. It is necessary, of course, for Mr. Cowan to take care of his work here, but I should think that he could be of considerable assistance to the project without interfering with his duties here, just as he is now helping the Syracuse Museum of Fine Arts, of which he is a trustee.

—RICHARD H. PASS, *Onondaga Pottery Company*

* Letter to President V. V. Kelsey dated April 25, 1938.

LOCAL SECTION NEWS

PITTSBURGH SECTION

The last meeting of the Section before the summer recess was held at Mellon Institute, Pittsburgh, Pa., May 10, 1938. The main speaker of the evening was L. D. Betz, W. H. & L. D. Betz Co. of Philadelphia, Pa., whose subject was "Water and the Correction of Its Impurities—the Colloidal Aspect." Mr. Betz discussed the various methods of boiler feed-water treatment and presented a motion picture on colloids. The feature of the picture was the showing of Brownian movement, as viewed through an ultramicroscope.

E. P. McNamara, supervisor of the Ceramic Extension Course of Pennsylvania State College, also discussed the extension service, and A. P. Chrisfield, Georgia School of Technology, who has deserted ceramics for commercial aviation and is with the Pennsylvania Central Airlines, Pittsburgh, told of the aims and operation of National Air Mail Week.

The next meeting of the Section will be in October.

—C. L. THOMPSON, *Secretary*

NORTHERN CALIFORNIA SECTION

The Northern California Section held an afternoon meeting on May 14, 1938. At that time, sixty members of the Section made an inspection trip of the new plant of the Owens-Illinois Pacific Coast Co., Oakland, Calif.

After dinner in the cafeteria of the new plant, the meeting was called to order by the Chairman of the Section, Clare S. Chaffee, Owens-Illinois Pacific Coast Co., who presented the subject of the evening, "The Manufacture of Glass Containers." Mr. Chaffee introduced Wendel A. Mahaffy, Owens-Illinois Pacific Coast Co., who talked on "Raw Materials and Batch." Mr. Mahaffy gave an able résumé of the benefits that civilization has derived through the use of glass in its many phases. He described in detail the glass container, giving particular attention to the various raw materials used in the process of manufacture. The sources of raw materials on this Coast and in other parts of the country were reviewed. Mr. Mahaffy paid particular attention to the properties of glass of differing composition and explained the influence of the several

chemical oxides on finished glass batch. He ended his discussion with the delivering of the raw batch to the furnace platform.

From this point, Mr. Chaffee took up the subject of "Furnace Operation." He described at length the types of glass furnaces in use and their main characteristics. This was followed by a general discussion on the various refractories used in the glass furnace and their effect on its operation. Mr. Chaffee acquainted the Section with the problems encountered in furnace operation and some of the methods employed to maintain efficiency in furnace operation. He carried his discussion to the point at which the molten mass is ready to be formed into the various products.

The next phase, "Feeding and Machine Operation," was taken up by B. A. Noble, Owens-Illinois Pacific Coast Co. He spoke of the various machines now used for the manufacture of glass containers. Several machines were described and their characteristics explained. Mr. Noble also explained the operation of the leers and their relation to glass container production. He closed his discussion with a description of the methods of shipping and packing employed in this modern plant.

Following the talks, there was an open discussion on glass technology.

The Section felt that the Owens-Illinois Pacific Coast Co., and particularly their General Engineering Department, should be complimented on the able manner in which the inspection trip through the plant and the subsequent meeting were conducted.

After the conclusion of the session on glass technology, a general business meeting was held. Plans were considered for a regional meeting or possibly a general meeting of the American Ceramic Society at the time of the San Francisco Exposition in 1939. Mr. Chaffee informed the Section of a proposed Chemical Congress now under consideration, which may be held some time in 1939. At the close of the business meeting, it was unanimously voted to hold no meetings during the summer. The next meeting of the Section, therefore, will be held in September, 1938.

—G. A. PAGE, *Secretary*

SOUTHERN CALIFORNIA SECTION

The Southern California Section held a dinner meeting at the Hotel Rossyln, Los Angeles, Calif., on April 29, 1938.

After dinner, Lee Bennett told of his impressions of the New Orleans Meeting. The feature of the evening was the sound motion picture "Heat and Its Control," which was presented through the courtesy of the Johns-Manville Corp.

—FRANKLIN MCCANN, *Secretary-Treasurer*

CENTRAL OHIO SECTION

Ortons Honored at Rites Beside Monument*

Accomplishments of Ortons Told by President Rightmire

Beneath an army tent, with falling raindrops the only accompaniment, words were spoken at Green Lawn Cemetery, Columbus, Ohio, May 23, 1938, honoring two whose names will always be on the roll of honor of Ohio State University.

In ceremonies sponsored by the Central Ohio Section of the American Ceramic Society, the Orton monument was dedicated to the memory of Edward Orton, Sr., once president of Ohio State University, and his son, Edward Orton, Jr., founder of the University's department of ceramic engineering.

"If society had more men of this type, this world would be a better place in which to live," said Dr. George Rightmire, president of the University and of the Edward Orton, Jr., Ceramic Foundation Board of Trustees, in concluding his words commemorating the two men.

Accomplishments Cited

Dr. Rightmire described briefly the accomplishments of both father and son. One of the senior Orton's greatest deeds, he said, was the steering of the Ohio Agricultural and Mechanical College into Ohio State University. Edward Orton, Jr., was lauded for organizing the department of ceramic engineering.

Wreaths were placed on the graves by Victor V. Kelsey, president of the American Ceramic Society, and C. Forrest Tefft, president of the Ohio Ceramic Association. A few words were spoken by each in the dedication.

Fifty Brave Rain

The monument, carved from a single, huge block of granite, with the family name inscribed upon it, was purchased with funds of the Edward Orton, Jr., Ceramic Foundation.

Approximately fifty persons braved the steady rain to assemble at the cemetery for the dedication at 6:00 P.M.

Following the ceremonies, a dinner was held at the Southern Hotel, at which Clyde E. Williams, director of the Battelle Memorial Institute, spoke on "Research in the Ceramic Industries."

* From the *Ohio State Journal*, Columbus, Ohio, May 24, 1938.

MICHIGAN-NORTHWESTERN OHIO SECTION

The Michigan-Northwestern Ohio Section held its spring meeting at Jackson, Mich., on May 6, 1938, at the Otsego Hotel. The guest speaker was Raymond Szymanowitz, technical director of the Acheson Colloid Co., of Port Huron, Mich. Mr. Szymanowitz traced the development and use of graphite. Nineteen members attended this meeting.

The officers elected for 1938–1939 are as follows:

President: Karl Schwartzwalder, AC Spark Plug Co., Flint, Mich.

Secretary: R. O. Lane, Macklin Co., Jackson, Mich.

—R. O. LANE, *Secretary*

WATCH YOURSELF GROW
BY GETTING MORE NEW MEMBERS

CERAMIC SCHOOL NOTES

UNIVERSITIES ANNOUNCE ADVANCED CERAMIC DEGREES, 1938

OHIO STATE UNIVERSITY

Doctor of Science in Ceramic Engineering

R. B. SOSMAN, Research Lab., United States Steel Corp., Kearny, N. J.

Master of Science in Ceramic Engineering

H. G. BERRY
W. B. FELTER

UNIVERSITY OF WASHINGTON

Master of Science in Ceramics

F. L. GOIN, U. S. Bureau of Mines Coöperative Fellowship for 1937–1938 in Ceramics and Nonmetallics.

Thesis: "Olivine as a Foundry Sand."

GERALD KRAVIK, U. S. Bureau of Mines Coöperative Fellowship for 1937–1938 in Ceramics and Nonmetallics.

Thesis: "Olivine as a Refractory."

Professional Degree of Ceramic Engineer

A. LEE BENNETT, Gladding, McBean & Co., Glendale, Calif.

Thesis: "Selenium Red Glazes and Talc Bodies."

RUTGERS UNIVERSITY

Doctor of Philosophy in Ceramics

A. W. HELZ (Fellow, Edward Orton, Jr., Ceramic Foundation; M.S., Univ. of Michigan; B.S., Univ. of Wisconsin)

Master of Science in Ceramics

D. J. BARBOUR (Fellow, Tile Industry Research Fellowship; B.S. in Chemical Engineering, Columbia Univ.; B.A., Columbia Univ.)

W. B. DERICK (Fellow, Tile Industry Research Fellowship; B.S., Rutgers Univ.)

UNIVERSITY OF ILLINOIS

Doctor of Philosophy in Ceramic Engineering, February, 1938

B. W. KING, JR. (B.S. Mech. Eng., Carnegie Inst. of Technology, 1931; M.S. Cer. E., Ohio State Univ., 1933)

Master of Science in Ceramics, June, 1938

B. NIKLEWSKI, JR. (M. of Philosophy in Chem., Poznan Univ., Poland)

MASSACHUSETTS INSTITUTE OF TECHNOLOGY

Doctor of Science in Ceramics

RUFUS N. PALMER

OHIO STATE UNIVERSITY

Ceramic Art Students

On the evening of May 17, 1938, nearly fifty members of the Ceramic Art Department of the University visited the offices of the American Ceramic Society. Mr. and Mrs. Purdy and the staff were hosts to the group.

The many varied exhibits in the executive offices of the Society were examined carefully.

A. E. Baggs, Head of the Ceramic Art Department, and Carlton Atherton of the staff were also present.

Ceramic Engineers, Student Branch

Fifty members of the Student Branch held their final meeting of the school year on the evening of May 18, 1938. The following officers were elected at this meeting: *President*, Sam Daugherty; *Vice-President*, Howard Petty; and *Junior Council Representative*, Robert Newton.

A brief talk was given by J. L. Carruthers of the Department of Ceramic Engineering on the organization of the American Ceramic Society and its relation to the ceramic students in the various engineering schools.

Following the business meeting, the boys enjoyed a social hour. Refreshments were served by Mr. and Mrs. R. C. Purdy and the Society staff.

A. S. Watts, Head of the Department of Ceramic Engineering, met with the students.

CLAY PRODUCT PLANT OPERATORS' CONFERENCE

University of Illinois

The Clay Product Plant Operators' Conference was held at the Ceramics Building, University of Illinois, Urbana, Ill., June 3 and 4, 1938. This Conference is the third that has been offered by the Department of Ceramic Engineering in coöperation with the Illinois Clay Manufacturers' Association, in place of the Short Course for Clay Workers which was given for a number of years. The Conference was planned primarily for the benefit of the plant man who is engaged in the production of structural clay products and refractories.

A group dinner on Friday evening was followed by a meeting of the Illinois Clay Manufacturers' Association.

(1) W. M. DUNAGAN, Dept. of Theoretical and Applied Mechanics, Iowa State College, Ames, Iowa, talked on "Slabs Made from Reinforced Tile." The wide-spread interest in reinforced clay masonry and its growing importance in construction work made this a timely subject. It is essential that the plant operator be familiar with the developments in this field so that he may know the requirements of his product and understand the production problems that may be involved.

(2) C. E. CARTER, Peoria Brick and Tile Co., Peoria, Ill., discussed "Development of New Forms of Clay Products for Residence Construction." This type of construction promises to be one of the most important outlets for structural clay products.

(3) J. G. SEANOR, superintendent of the Alliance Brick

Co., Darlington, Pa., talked on "Delayed Combustion in Downdraft Kilns," which was of interest to all clay plant operators, inasmuch as the process of combustion and its control is a vital factor in successful firing.

(4) C. W. PARMELEE, Head, Dept. of Ceramic Engineering, Univ. of Illinois, spoke on "Clay Testing as a Means of Control of the Product." The methods of determining the working and firing properties of the raw material as a check on its quality and uniformity are of interest to the plant man. Routine or occasional tests will frequently be the means of solving problems or avoiding difficulties in manufacture.

(5) W. R. MORGAN, Dept. of Ceramic Engineering, Univ. of Illinois, discussed "Influence of Particle Size in the Clay Body." The effect of finer or coarser grinding and gradations of particle size on the working properties and on the properties of the finished product is receiving increasing attention among manufacturers. Careful control has been adopted in many cases as a means of insuring uniformity and the desired quality of the product.

GEORGIA TECH STUDENT BRANCH WAITS TEN YEARS FOR CHARTER

Ten years after its formation, the Georgia Tech Student Branch of the American Ceramic Society was chartered by the parent Society at a banquet Saturday afternoon, May 14, 1938, at the Georgian Terrace Hotel, Atlanta, Ga. Ross C. Purdy, Columbus, Ohio, General Secretary of the American Ceramic Society, was the principal speaker, and Emerson Poste, Chattanooga, Tenn., Past-President, presented the charter.

Although the Georgia Tech Ceramic Engineering Department was founded in 1923, it was 1927 before the enrollment had grown to such an extent as to warrant formation of a Student Branch. In that year, an organization was formed, and George M. Johnson, first ceramic engineering student at Georgia Tech, was elected president. Lane Mitchell of the present departmental staff was then a student and a member of the original group. The organization functioned for several years, during which time no charter was applied for or obtained. Finally, the Student Branch became inactive until reorganized in 1936. John B. Napier was first president of the reorganized group which applied for a charter. The officers for this year are Holt B. Grace, *President;* D. L. Nowell, *Vice-President;* R. B. Williams, *Secretary;* and M. J. Scavens, *Treasurer.* President Grace received the charter from Mr. Poste. The names both of the original and reorganizing groups appear on the charter.

The presence of Mr. and Mrs. Purdy and Mr. Poste at the occasion was highly appreciated by the Tech students. Twenty-five students of the Georgia Tech Department of Ceramic Engineering heard these men speak. Mr. Purdy urged the students to make the best use of their time and stated that time-wasters had no place in the ceramic industry.

After the banquet, the entire body moved over to the ceramic engineering building for the Second Annual Ceramic Carnival presented by the Georgia Tech Student Branch. Two hundred invited guests assembled for the Carnival. Refreshments were served by several of the faculty wives.

Each room of the building was devoted to a separate exhibit. The kiln room had a kiln of pottery under fire, with peepholes arranged so that guests might see the hot interior. Pottery making by the casting method and testing of clay were demonstrated. One room housed an extensive exhibit of Georgia kaolin, products from kaolin, and a small-scale kaolin pit model, stressing Georgia kaolin as the theme of the Carnival. A student garbed in a red Satan's costume placed souvenir ash-trays in a red-hot furnace with his pitchfork to fix permanently signatures of the guests. Pressing, re-pressing, filter-pressing, jiggering, and throwing were demonstrated and explained. W. J. Gordy of the Georgia Art Pottery demonstrated the hand-throwing of pottery.

On the lawn, bingo and dart-throwing games were arranged so that everyone won a souvenir. A department-made motion picture, "Making Pottery," was shown in the classroom.

The "Horror Chamber" was lined with "death-masks" of the members and consisted of a display of fluorescent materials glowing with an eerie light under a mercury-vapor lamp. Richard W. Smith of the State Division of Mines, Mining, and Geology lectured on this subject.

A. V. Henry, Lane Mitchell, W. H. Vaughan, and Julian Harris acted as hosts for the occasion.

—A. V. HENRY

LETTERS TO THE EDITOR

FREDERICK CARDER AND MISS McLAUGHLIN APPRECIATE HONORARY MEMBERSHIPS

May 2, 1938

I want to thank you and the Society for making me an Honorary Member of the Society and for the fine illuminated notification you sent me recently.

It certainly came as a great surprise, as I was not aware that the Society thought so well of my efforts in trying to raise the standard of the glassmaking art.

Yours sincerely,

FREDERICK CARDER

May 24, 1938

In acknowledging the honor conferred upon me by the American Ceramic Society in making me an Honorary Member of the Society, I wish to express my gratification and pleasure in this recognition of my efforts in ceramics, which I feel were so inadquate to what I hoped and intended to accomplish. My only regret is that I could not carry out a fascinating pursuit as I had hoped, thus reviving an interest in this, the highest of the potter's art, porcelain.

M. LOUISE MCLAUGHLIN

NECROLOGY

WILLIAM K. BROWNLEE

William K. Brownlee died March 23, 1938, at Fort Lauderdale, Fla., a victim of pneumonia.

He was born September 6, 1868, at Wellsburg, W. Va., of Scotch-Irish parentage.

W. K. Brownlee

After a grade-school education, he adopted the trade of bricklayer and, as bricklayer-foreman for the construction firm of Nichols & Mathews, he erected glassmelting furnaces in many parts of the country.

In 1900, Mr. Brownlee entered the employ of the Libbey Glass Company as superintendent of construction and repair of furnaces. During this time and in later years, he was an active student in all matters relating to glass and refractories and was closely associated with the development of the machine age in glass production, notably the Owens bottle, the Westlake bulb, the glass-tube drawing machines, and the early development of the Libbey-Owens sheet-glass process for manufacture of window and plate glass.

An associate of M. J. Owens, S. O. Richardson, Jr., and many others, his ideas and counsel on matters concerning refractories and their application to the special problems arising from such machine development were valued and sought.

In 1909, Mr. Brownlee organized, with others, the Buckeye Clay Pot Company, of which he was president and general manager until December, 1931, when the Buckeye Company was consolidated with the Laclede-Christy Clay Products Company of St. Louis. He continued as vice-president of Laclede-Christy until his death.

During 1916 and 1917, he was instrumental in the organization of the Farber Fire Brick Company, Farber, Mo., and acted as president of this Company until its merger with North American Refractories Company in 1929.

He was a pioneer in the use of the continuous tunnel kiln for firing fire brick and at Farber, Mo., he designed and built the first kiln of this type used west of the Mississippi River.

With an active, practical, and analytical mind, Mr. Brownlee was always seeking new and improved methods and devices for improvement of products, service to customers, and efficiency of production. In this category might be mentioned the developments of the extrusion process for the manufacture of tank blocks and the handling of large blocks by means of vacuum. He was a pioneer in the development of de-airing clay for the manufacture of tank blocks and refractories; he invented and developed the drop throat, known also as submarine, now in general use in certain types of glass furnaces.

Mr. Brownlee had been an active member of the American Ceramic Society since 1918.

THOMAS N. KURTZ

Thomas N. Kurtz, aged 55, widely known in the refractories and steel industries, died in Magee Hospital on April 20, following an illness of several months.

Mr. Kurtz was born in Johnstown, Pa., and, when 15 years of age, he began his career in the refractories business with A. J. Haws. Later he became associated with Mr. Haws and Scott Dibert, who operated the first silica brick plant at Mt. Union, Pa., where he remained until 1913. Later he organized the Standard Refractories Company at Claysburg, of which he was president and general manager. He continued there until 1922, when the Company was absorbed by the General Refractories Company.

In 1926, Mr. Kurtz acquired control of the United States Refractories Corporation of Mt. Union and became its president. In 1930, the Company was bought by the North American Refractories Company. Mr. Kurtz was elected vice-president of this Company, a position he held until the time of his death.

Mr. Kurtz had been a member of the American Ceramic Society since 1918. He was also a member of the American Refractories Institute.

A. H. BEEMAN

A. H. Beeman, Beeman Sales & Engineering Co., Detroit, Mich., died on May 21, 1938. Mr. Beeman was the District Sales Representative of the Ironton Fire Brick Co., Ironton, Ohio. His membership has been transferred to his son, E. A. Beeman.

JOSEPH WILLIAM MELLOR

July 9, 1869–May 24, 1938

1. Born at Huddersfield, England.
2. B.Sc. Manchester, England.
3. D.Sc. Dunedin, New Zealand.
4. Fellow of the Royal Society, 1926.
5. Professor of Chemistry, Owens College, Manchester.
6. Principal of the Pottery School and Director of Staffordshire County Pottery Laboratory (later the North Staffordshire Technical College), 1905–1934.
7. Elected Secretary and *Transactions* Editor of the English Ceramic Society on September 2, 1905, and served thus until 1934 when his title was changed to Honorable Secretary.
8. Director of Research for British Refractories Research Association, 1934–1938.
9. The Mellor Laboratories were established in 1934 by the British Refractories Research Association and named in recognition of Dr. Mellor's distinguished services in ceramics.
10. A fitting tribute to J. W. Mellor, Honorable Secretary of The Ceramic Society, England, is in an editorial in *Chemistry and Industry*, **56** [45] 993 (1937), on completion of the 16th volume of Comprehensive Treatise on Inorganic and Theoretical Chemistry. See also *Bull. Amer. Ceram. Soc.*, **16** [12] 492 (1937).
11. Scientist, author, teacher, and leader; with it all a good fellow, a humorist, a faithful and true friend.

We of the American Ceramic Society who honored ourselves in 1932 by electing Dr. Mellor as Honorary Member of our Society mourn the loss of a friendly co-worker. We met him and Mrs. Mellor in 1927 and again in 1929, learning to love them as they are loved by their own countrymen.

References

Who's Who in Science, International, 1914.
Who's Who.
Who's Who in England.
J. C. Poggendorff's Biographisch. literarisches Handwörterbuch für Mathematik, Astronomie, Physik, Chemie, und verwandte Wissenschaftsgebeite. Vol. 5, 1904–1922, published in 1926; also Clay and Pottery Industries, Vol. 1.

Books Written by Dr. Mellor

1. Chemical Statics and Dynamics, 542 pp., 1904; revised in 1915.
2. Crystallization of Iron and Steel, 154 pp., 1905.
3. Chemical Statics and Dynamics, 503 pp., 1909.
4. Higher Mathematics for Students of Chemistry and Physics, 641 pp., 1913.
5. Introduction to Modern Inorganic Chemistry, 700 pp., 1914.
6. Treatise on Ceramic Industries: I, Treatise on Quantitative Inorganic Analysis, 778 pp., 1913.
7. Modern Inorganic Chemistry, 892 pp., 1917.
8. Log-Book of Voyage of the Ceramic Society to New York—Mellor's Nonsense, 1929.
9. Comprehensive Treatise on Inorganic and Theoretical Chemistry, Vols. I–XVI, 1920–1937.
10. Tables to Facilitate Calculations of Formulae from Analysis and Recipes, reprinted from *Trans. Eng. Ceram. Soc.*, Vol. XII, 1913, edited by J. W. Mellor, 1937.
11. Clay and Pottery Industries, edited by J. W. Mellor, 1914.

Publications of J. W. Mellor in Transactions of The Ceramic Society

Volume 4 (1904–1905)

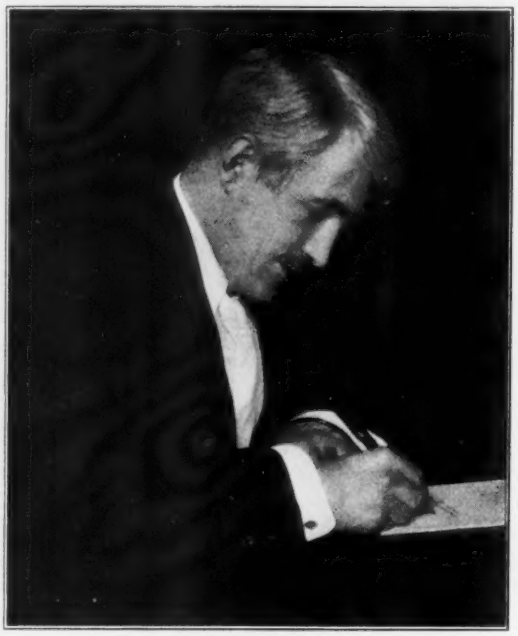
(1) "Crystallization in Pottery," pp. 49–65.
(2) "Notes on the Crimson-Chromium Tin Glaze," with F. J. Rodgers, pp. 66–71.

Volume 5 (1905–1906)

(3) "The Plasticity of Potter's Materials," pp. 72–74.
(4) "The Minute Structure of Porcelain, Parian, Semi-Porcelain and Earthenware, with a Note on the Crystallization of Glazes," pp. 75–92.
(5) "Comparison of the Thermal Expansion of Floor Tiles and Cement," pp. 159–62.

Volume 6 (1906–1907)

(6) "The Determination of the Amount of Soluble Salts in Clays, etc.," pp. 54–57.
(7) "Excess Air in the Firing of Ovens and Kilns," pp. 58–70.
(8) "The Sulfuring and Feathering of Glazes: II," pp. 71–75.
(9) "The Influence of High Temperatures on Porcelain Pyrometer Tubes," pp. 76–78.
(10) "Cobalt Blue Colors," pp. 88–96.
(11) "The Setting of Cement and the 'Buckling' of Floor Tiles," pp. 123–27.
(12) "The Scumming of Mazarine Blue," p. 128.
(13) "The Action of Heat on Refractory Materials," with F. J. Austin, pp. 129–41.
(14) "Pyritiferous Clays," pp. 142–52.
(15) "The Action of Cobalt Salts on Clay," with A. D. Holdcroft, pp. 153–58.
(16) "Studies on Clay Slip: I," with S. A. Green and T. Baugh, pp. 161–70.
(17) "Centrifugal Extractors *vs.* Filter Presses," p. 171.



J. W. Mellor, D.Sc. F.R.S.

Volume 7 (1907–1908)

(18) "The Adsorption and Dissolution of Gases by Silicates—'Spit-Out,'" with Bernard Moore, pp. 1–20.
(19) "The Action of Heat on Binary Mixtures of Feldspar, Flint, and China Clay," with Arthur Heath, pp. 80–100.
(20) "Pyritiferous Clays (II)," pp. 112–13.
(21) "Regulation of the Temperature of Electric Muffles," pp. 114–16.
(22) "The Imitation of Fired Pottery Bodies," pp. 117–21.
(23) "Composition of Fractions of Clay of Different Degrees of Fineness," with A. Heath, pp. 151–52.

Volume 8 (1908–1909)

(24) "A Note on the Nomenclature of Clays," pp. 23–30.
(24*a*) "Imitation of Fired Pottery Bodies," pp. 46–47.
(25) "The Determination of Small Amounts of Iron in Clays, etc.," pp. 125–31.
(26) "Colorimetric Determination of Cobalt in Presence of Nickel," p. 132.

Volume 9 (1909–1910)

(27) "Studies on Cylinder Grinder," pp. 50–73.
(28) "The Frit-Kiln Bridge," pp. 74–78.
(29) "The Speed of Vitrification of Clays," pp. 79–91.
(30) "Note on the Fusing Test as a Standard of Refractoriness," pp. 92–93.
(31) "Jackson's and Purdy's Surface Factors," pp. 94–113.
(32) "Nomenclature of Clays, II," pp. 114–19.
(33) "The Softening Temperatures of Lead-Silica Glasses," with A. Latimer and A. D. Holdcroft, pp. 126–49.
(34) "The Nomenclature of Silicates," pp. 150–52.

Volume 10 (1910–1911)

(35) "The Chemical Constitution of the Kaolinite Molecule," with A. Holdcroft, pp. 94–120.
(36) "Note on Laboratory Grinders," pp. 121–23.

Volume 11 (1911–1912)

(37) "The Chemical Constitution of the Kaolinite Molecule (II)," with A. D. Holdcroft, pp. 169–73.
(38) "Five Fallacies in Pottery," with Bernard Moore, pp. 178–87.

Volume 12 (1912–1913)

(39) "The Behavior of Some Glazes in the Glost Oven, (I)," pp. 1–17.
(40) "The Simultaneous Determination of Small Quantities of Titanium and Vanadium Colorimetrically," pp. 33–35.
(41) "Tables to Facilitate the Calculation of Formulae from Analyses to Recipes," pp. 100–201.
(42) "The Specific Heats of Fire-Bricks at High Temperatures," with S. T. Wilson and A. D. Holdcroft, pp. 279–84.

Volume 13 (1913–1914)

(43) "Action of Flue Dust on Firebrick (I)," pp. 12–14.
(43*b*) "The Behavior of Some Glazes in the Glost Oven (II): Damp and Dry Spots," pp. 30–34.
(44) "Nickel in Glaze Colors (I)," with H. Wicks, pp. 61–66.
(44*a*) "Note on Magnetic Pottery," pp. 80–81.
(45) "The Chemical Constitution of the Kaolinite Molecule (III)," with A. D. Holdcroft, pp. 83–113.

Volume 14 (1914–1915)

(46) "Slop Weight and Specific Gravity of Solutions of Water Glass," with H. Steele, pp. 164–66.
(46*a*) "Cobalt and Nickel Colours," with A. D. Hollinshead and J. Turner, pp. 167–72.
(47) "Some Notes on Hard or Feldspathic Porcelain," pp. 176–92.

Volume 15 (1915–1916)

(48) "Studies on Flint and Quartz (I–III)," with A. J. Campbell and Bernard Moore, pp. 77–116.
(49) "The Effect of Loads on the Refractoriness of Fireclays," with B. J. Moore, pp. 117–30.
(50) "A Note on Chrome-Tin Pink," pp. 131–32.

Volume 16 (1916–1917)

(51) "The Texture of Firebricks," pp. 40–57.
(52) "Some Discolorations in the Manufacture of Pottery and Brick," pp. 58–66.
(53) "The Effects of Water on Frits During Wet Grinding," pp. 67–68.
(54) "The Origin and Meaning of the Term 'Ceramic,'" pp. 69–70.
(55) "Can the Firing Temperature of a Body be Determined from the Microscopic Appearance?" pp. 71–72.
(56) "Do Fireclays Contain Halloysite or Clayite?" pp. 73–84.
(57) "The Spalling of Magnesite Bricks (I)," pp. 85–100.
(58) "Black Cores in Fireclay Goods," pp. 259–67.
(59) "An Examination of the After-Contraction or After-Expansion of Firebricks in Oxidizing and Reducing Atmospheres," pp. 268–69.
(60) "The Hot and Cold Sizes of Firebricks," pp. 270–73.

Volume 17 (1917–1918)

(61) "On the Testing of Refractory Materials," pp. 90–103.
(62) "The Standardization of Tests for Refractory Materials (Part I)," J. W. Mellor, *et al.*, pp. 300–30.
(63) "The Deterioration of Molds During Storage," pp. 331–35.
(64) "Effect of Load on the Refractoriness of Firebricks, etc.," with W. Emery, pp. 360–71.

Volume 18 (1918–1919)

(65) "The Corrosive Action of Flue Dusts on Firebricks," with W. Emery, pp. 230–50.
(66) "The Standardization of Tests for Refractory Materials, (Part II)," J. W. Mellor, *et al.*, pp. 251–63.
(67) "A Note on Blue Glass," pp. 478–80.
(68) "Recent Research on the Bone China Body," pp. 497–509.
(69) "The Standardization of Tests for Refractory Materials (Part III)," J. W. Mellor, *et al.*, pp. 516–17.

Volume 19 (1919–1920)

(70) "Unestimated Losses in Pottery Manufacture," Discussion with C. D. Grimwade, B. Moore, A. Fielding, and F. Morrall, pp. 14–25.

Volume 20 (1920–1921)

(71) "A Plea for Toleration in Art," pp. 11–15.
(71*a*) "Note on Thorpe's Solubility Ratio," p. 120.

Volume 21 (1921–1922)

(72) "On the Plasticity of Clays," pp. 91–103.
(73) "The Dehydration of Dried Clays," with N. Sinclair and P. S. Devereux, pp. 104–106.
(73*a*) "Adsorption and Dissolution of Gases by Silicates, 'Spit-Out,'" with Bernard Moore, pp. 289–316.

Volume 22 (1922-1923)

(73*b*) "Notes on Crystalline Structure of Some China Clays Examined by the X-Ray Powder Method," with William Bragg and G. Shearer, pp. 105–110.
(73*c*) "Note Books of Josiah Wedgwood," with B. Moore, pp. 275–82.

Volume 23 (1923–1924)

(74) "The Zenith Temperature," p. 13.
(75) "Terra Sigillata Not Samian Ware," pp. 176–77.
(76) "Note on the Use of Fluorspar in Leadless Glazes," p. 178.
(77) "The Discovery of China Clay in Europe," pp. 179–81.
(78) "The Action of Heat on Kaolinite and Other Clays, I," with A. Scott, pp. 322–29. In Italian, pp. 330–37.

Volume 25 (1925–1926)

(79) "Work's Logic—The Whiskey and Soda Fallacy," p. 225.

Volume 29 (1929–1930)

(80) "A Study of Pan Grinding," pp. 271–79.

Volume 30 (1930–1931)

(81) "The Batting Machine, Jollying and Jiggering," pp. 235–43.

Commemoration Volume (1930)

(82) "A Second Note on the Surface Factor," pp. 251–57.
(83) "On the Manufacture of Felspathic, or Hard Porcelain, from British Raw Materials," with B. Moore, pp. 258–74.

Volume 31 (1931–1932)

(84) "The 'Pinch Effect' in the Crazing of Tiles," pp. 129–30.

Volume 32 (1932–1933)

(85) "Discoloration of Refractories by 'Iron,'" pp. 403–14.

(86) "Some Notes on the Shrinkage of Clays During Drying," pp. 455–71.

Volume 34 (1934–1935)

(87) "The Crazing and Peeling of Glazes," pp. 1–112.

(88) "Durability of Pottery Frits, Glazes, Glasses, and Enamels in Service," pp. 113–90.

Volume 35 (1935–1936)

(89) "Chemistry of the Chinese Copper-Red Glazes, I," pp. 364–78.

(90) "Chemistry of the Chinese Copper-Red Glazes, II," pp. 487–91.

(91) "Spitting of Glazes in the Enamel Kiln, I, pp. 1–43; II," pp. 355–63.

Volume 36 (1936–1937)

(92) "Cobalt and Nickel Colours," pp. 1–9.

(93) "Spontaneous Rupture of Aged Pottery," pp. 10–12.

(94) "Cultivation of Crystals on Glazes," pp. 13–15.

(95) "Chemistry of the Chrome-Tin Colours," pp. 16–27.

(96) "Discoloration of Chrome-Green Colors," pp. 28–30.

(97) "Ferric Oxide Colours," with G. E. Meir, pp. 31–43.

(98) "Retrospection," pp. 44–48.

(99) "Sherlock Holmes," pp. 255–63.

(100) "Cobalt Blue Colors," pp. 264–65.

(101) "Note on Molecular Formulae of Clays and Glazes," pp. 323–25.

(102) "Absent-Minded Beggar," pp. 405–13.

(103) "Crazing of Glazed Wall-Tiles in Service," pp. 443–65.

Volume 37 (1938)

(104) "Chemical Constitution of Clay Molecule: VI, Review of Later Theories," pp. 118–25.

(105) "Note on Study of Pan Grinding," pp. 126–29.

Joseph W. Mellor, One of Our Honorary Members*

A Scientist and Caricaturist

The following notice is taken from the *Evening Sentinel*, of Staffordshire, England, May 21, 1932.

All who take an interest in the scientific side of the pottery industry will appreciate the gesture of the AMERICAN CERAMIC SOCIETY in conferring Honorary Membership upon Dr. J. W. Mellor, F.R.S., Hon. Secretary of the Ceramic Society of this country, and principal of the Pottery Department of the North Staffordshire Technical College. Research work, in which Dr. Mellor has played so prominent a part, forms a most valuable aid to the practical potter in the maintenance of this unrivalled standard of technical perfection.

One frequently finds that men possessing shrewd, scientific minds have a lighter side to their temperament, but it is not often they find such effective expression as in the amusing sketches by which Dr. Mellor delights to portray the humorous aspect of dignified assemblies. His pictorial commentaries on the gatherings during the Josiah Wedgwood Bicentenary celebrations are still remembered, and in the droll cartoons on his recent illness he showed once more that, like a true caricaturist, he does not spare even his own misadventures when they offer a promising subject.

Dr. Mellor jokes at his own expense. During the china trade safeguarding inquiry an official of the British Pottery Manufacturers' Federation asked him to come at once to a meeting in order to decide a technical problem which had arisen. "All right," replied Dr. Mellor, "as soon as I have read 'Pip, Squeak, and Wilfred.'"

This story and the fact that Dr. Mellor reads Wild West adventures indicate why he is called Peter Pan. He positively refuses to grow up.

* *Bull. Amer. Ceram. Soc.*, **15** [7] 187 (1932).

HONORING DR. J. W. MELLOR, F.R.S.*

When Dr. Joseph W. Mellor was elected Fellow of the Royal Society, the Council of the Ceramic Society decided to mark the occasion by entertaining Dr. and Mrs. Mellor

* Excerpts from *Trans. Ceram. Soc.* [Eng.] **26,** lxxiii–lxxxiii (1926–1927).

Peter Pan in trouble again — ptomaine poisoning this time. They took him to a private hospital.
L'INFERNO
Naughty Justice! In what store thou keep'st New pains, new torments as were here endured! Whatever fault of ours hath brought us to this? Dante.
He now wants a lot more of the same kind of trouble .... it was worth while!
IL PARADISO
...Know'st thou not thou art in heav'n And know'st not thou, whatever is in heav'n Is holy, and that nothing there is done But is done zealously and well? Dante.

with a dinner and a suitable presentation. The subcommittee responsible received subscriptions from members in all parts of the world, many of whom could not attend the dinner and presentation.

On the evening of October 20, 1926, officials, members, and friends gathered at the North Stafford Hotel, Stoke-on-Trent, to honor Dr. Mellor. . . . .

The "Loyal Toast" having been honored, the President, H. J. C. Johnston, submitted the toast of the evening: "Dr. Mellor, F.R.S.". . . . .

MR. JOHNSTON then said that many of them had had the privilege of knowing Dr. Mellor for a longer time, but in the case of such a man, friendship was not, perhaps, to be measured by a term of years. Any one in the Ceramic Society knew that friendship with Dr. Mellor meant something they could understand. His own friendship with Dr. Mellor had perhaps been of a somewhat peculiar character. In public they had "pulled one another's leg" unmercifully, and any two friends who could do that, without any breach of friendship, and still retain some measure of esteem—on his part a very high measure of esteem for Dr. Mellor—had a bond of friendship which was not to be despised.

That evening they had met to celebrate the election of Dr. Mellor to Fellowship of the Royal Society. . . . .

The Royal Society was founded somewhere about the middle of the Seventeenth Century, and it had gained such prestige that it was the greatest honor any scientist could gain to be elected a Fellow. That was why they were so proud that their friend, Dr. Mellor, was reckoned among the number.

Dr. Mellor will go down in history among a great section of the scientific community for his monumental work on chemistry. As a selfish ceramist, I would be inclined to begrudge the time he has devoted to that great work, when there are so many problems still unsolved in our industry. But whether we consider Dr. Mellor in the light of science or as a man, I would suggest that his outstanding characteristics are his genuineness, his unselfishness, and his lack of self-consciousness. When we have passed away and the friendly touch by which we know him today is no more, I venture to say that the student of ceramic science and the ceramic industry will find in Dr. Mellor's works, in the years to come, those characteristics and an absence of those self-praising idiosyncrasies which are so common in scientific writings. They will see that Dr. Mellor has labored for this industry from genuine and unselfish motives. The greatest pride I should feel, if I were Dr. Mellor, would lie in the fact that I had met many manufacturers who, in the first place, had a benevolent or even an armed neutrality on the question of scientific research and the more intimate scientific inquiry carried out on their own factories. Today, those who formerly possessed that neutrality are among Dr. Mellor's greatest supporters in organized, collective research, and in the carrying on of research work in their own works. That is a thing of which Dr. Mellor can be justly proud.

We wish Dr. and Mrs. Mellor a long continuance of the enjoyment of the best and happiest things of life. And I say to Dr. Mellor that so long as he lives, he may be assured of the fellowship, not only of the Royal Society, but of a vast number of people in every walk of life, and more especially every one connected with the ceramic industry throughout the world.

FRED TURNER, a Past-President, supporting the toast, said . . . . . that the gathering was not being held and a presentation made to Dr. Mellor merely because he had been justly honored by the Royal Society. That was very gratifying to all of them, and they felt that the Ceramic Society had gained in dignity and in prestige, but they were concerned with a much more personal matter than that. The dinner and presentation were essentially an expression of the high regard in which Dr. Mellor was held, and of gratitude and appreciation for the fine work he had done for the Ceramic Society for over twenty years.

This can perhaps be best appreciated by those who remember its modest beginning when it was initiated by W. Jackson as the North Staffordshire Ceramic Society. Those days were very helpful, but the scope was limited, and the procuring of papers for discussion was becoming increasingly difficult. In the course of time, Dr. Mellor stepped into the breach and our difficulties vanished. Since he has been Secretary, he has carried the whole of the burden, and it was no light one. He has been responsible for the great advance the Ceramic Society has made, and has established it as one of the great national, and I might almost say international, technical societies.

In Dr. Mellor we recognize a man of outstanding ability, specially endowed by nature with great mental gifts which he has developed to a high degree of efficiency, and yet combined with those human qualities which render his acquaintance a pleasure as well as an education and a help. So we rejoice in his well-merited honor, and we felt it to be a fitting occasion on which to show him our appreciation of his work and our admiration for him as a man.

Perhaps I shall be pardoned for mentioning another very important phase of the Doctor's work—as Principal of the School. I remember years ago when Mr. Heath, Mr. Richardson, and myself were assistant instructors in the Pottery School, and W. Jackson, for whom we had a great regard, was the Principal. Mr. Jackson retired, and we learned of the appointment of Dr. Mellor to the post. None of us had any previous acquaintance with him, but we learned of his reputation as a scientist and wondered how we should get along together. But Dr. Mellor was an illustration of how quickly a trained scientific mind of his caliber can come to grips with the intricacies of a technical subject like pottery. It was like giving biscuits to an elephant, for in a very short time he knew more about pottery than we ever knew. As Principal of the School, Dr. Mellor was all that could be desired, always helpful and considerate, and possessing those qualities which secure the best from other people.

The years since have proved him to be the right man in the right place, and the industry owes more to his patient, helpful, and tactful work than it realizes. He does not profess to be able to solve every secret of pottery research, but he has solved many of them.

FRANK WEST, a Past-President, also supported the toast and said . . . . . that it was indeed rare in the record of their lives as clay or refractories workers that one of their band was honored by being made a Fellow of the Royal Society. The worthy Doctor in being so honored had created a landmark in the history of ceramics, for the Royal Society was

the innermost circle of scientific distinction, the most select coterie of scientists in the world.

A great scientist, who combines profound learning with foresight, tact, and, above all, a rare sense of humor, Dr. Mellor has been the center of the technical side of the clay and refractories industries for well-nigh a quarter of a century. A review of our guest's life is most assuredly a history of effort, a realization of an object. . . . . .

As to his characteristics, I would say that one of the chief reasons we have such an affection for him is the sincere manner in which he tackles our problems. When we approach him with a difficulty he does not give us some ready-made formulas, but judges it on its merits, however trivial the subject may appear, and gives his advice with a sympathetic consideration for one's feelings. One wonders how it is he keeps out of a groove. Perhaps it is his light reading during his recreation, the "dreadfuls" and "thrillers" he reads at such times, and the matches he consumes. In conclusion I may say that we are all proud of the honor which has been conferred on our friend, and we sincerely hope he will be with us many years to enjoy it. I can rightly claim for him, "something attempted, something done."

The Presentation

In submitting the toast, the President mentioned that Dr. Mellor was the second Fellow of the Royal Society associated with the industry. The previous election of a Fellow from the industry was some 180 years ago, in the person of the great Josiah Wedgwood, the father of the English potting. He was quite sure they would all agree that in Dr. Mellor they had an excellent second on the roll of Fellows of the Royal Society.

"It is my duty, privilege, and pleasure to extend to you, on behalf of the Ceramic Society, our heartfelt congratulations on the honor conferred upon you, in token of which we raise our glasses to you," said Mr. Johnston.

The toast was received with immense enthusiasm and was accorded musical honors.

Dr. Mellor then replied to the toast in part as follows: Thank you, Mr. Chairman, Ladies, Mr. Moore, Mr. Turner, Mr. West, and everybody. It likes me well. I am just about paralyzed with the first paroxysm of pride. It seems half a sin even to attempt to translate into words the joy I feel. Once upon a time I drank half a glass of champagne, and behold, as by magic, it seemed to me as if God could have made better people than were in the room, but God never did. This world seemed to be the best of all possible worlds, and the people the best of all possible people. I have had no champagne tonight, but I have the same champagne-feeling about everybody. . . . .

I thought at the time I was appointed that two or three years would see me through, but, alas! I knew a great deal more then than I do now. So far as my memory goes I had an attack of *die Wanderlust* about 1908. I was recommended by the London Committee for the Professorship of Chemistry at the Sydney University, and the appointment was subject to confirmation by the Vice-Chancellor, who was starting for England. Mr. Bernard Moore will perhaps be surprised to know that it was through his influence that I withdrew before the Vice-Chancellor arrived. However, I am very glad indeed that I withdrew, and one of my partner's proudest possessions is the thing-a-me-bob in silver which you gave her when you knew I had withdrawn. I had a terrible time the night of the dinner; and here I am again afflicted with a relapse. . . . .

What has overwhelmed me is the fact, demonstrated by scores and scores of letters from near and far, that the election has given even more pleasure to my friends than it has to myself. I should, however, ruthlessly cut you all out of my will if I imagined that you thought any better of me because of the election. After all, it is only one of those external things which do not count inside. Borrowing words from the immortal Bobby:

> "The rank is but the guinea stamp,
> The man's the gowd for a'that."

. . . . . There are now but few doubters of the utility of research, and the doubters who remain have no compunction in filching the results of the others. They are becoming parasites on the industry. If a start had to be made today on so pigmy a scale, it would be laughed to scorn, but, between you and me, I never have much faith in beginnings made to the beating of the big drum. Speaking generally, I think that in the past the world has had to depend for progress on the few men who have seen clearly beyond their noses an inch or two farther than their fellows. These men have had the tenacity of a bulldog and the pachyderm of a rhinoceros so that, in spite of innumerable rebuffs, they have marched persistently onward. Ultimately, the big majority has been compelled meekly to follow their lead. I could give scores of illustrations.

I suppose that, in common with most Englishmen, I very seldom expose my real feelings to the gaze of any daw, preferring to hide serious thoughts behind trivial words. But I will say this, I would far rather be the means of discovering certain kinds of facts, either directly or through any suggestions I might have made to students or friends, than be the recipient of any honor which it is possible for the world to bestow. I also think that individuals do not count in the ultimate. Happy the man who can enjoy seeing others reaping where he has sown, even though the sower be forgotten. He is but little perturbed by priority claims and by the fear of the "picking of his brains." It is our present job to try to make just a wee bit of progress, so that those who follow can use the knowledge we have bequeathed to them to make fresh conquests. The ultimate object is to lighten the darkness of profound ignorance which now besets all of us on every side.

I must conclude these disjointed reminiscences saturated with capital I's. You will have to forgive me because I cannot express my gratitude in words. Words are poor things on occasions like these; they seem rather to conceal than reveal what I want to say. The best of all is that you have pleased my wife. She has always taken on her shoulders every care not directly connected with my work. She therefore merits a half-share in all the nice things you have so kindly said, and the whole share of the handsome presents you have so generously given. I think I can safely say for us both, that however much we have liked the melodious things you have said, and however much we prize and cherish the beautiful mementoes you have given,

our hearts are singing with gratitude for the spirit of comradeship and good fellowship with which we all have always worked together for the common good.

LETTER FROM W. E. S. TURNER

May 30, 1938

Dear Mr. Purdy,

My brief cable of Saturday morning will doubtless have been received with something of a shock. It may be known to you, however, that Dr. Mellor has been ill for many months and his intimate friends have known that there was no hope of a cure and that very soon the parting must come.

He has remained cheerful throughout the last illness and the sense of humour, which, with his courage and fine outlook have sustained his efforts, did not desert him and he had no complaints when his friends visited him to sympathise.

As you know, he was a man of character and of idiosyncrasies, and it was due to one of these latter that his friends were not informed earlier of his approaching end and death. He had made a special request that his friends should not be informed of his death until he had actually been buried; hence, the announcement which appeared on Saturday came as a shock to many even of his intimate colleagues.

We have all recognized Mellor for many years as an outstanding figure and I believe that he has not only left his mark on the present generation but that his name will remain bright in the annals of the ceramic field.

Today, in my own Department, we are showing honour and respect to his name by flying our flag at half-mast.

Yours sincerely,

—W. E. S. TURNER

NOTES AND NEWS FOR CERAMISTS

THE CERAMIC INDUSTRY AT THE NEW YORK WORLD'S FAIR, 1939

Unlike many other industries, the ceramic industry is fortunate in having drama, visitor appeal, esthetic quality (three requisites for a striking and effective exhibit) inherent in its activities and its products. It is fortunate also in having three major noncompetitive branches with strong trade associations.

It is suggested, therefore, that the industry present a coördinated industry exhibit with adjacent individual exhibits in the building designated as V-7 at the World's Fair.

General Plan

There can be three great halls with a gross area of 4000 square feet each, the Hall of Pottery, the Hall of Glass, and the Hall of Enameling.

Theme Exhibit in Central Rotunda

Because of the design of the building and the close relations of the two branches, pottery and glass, 2000 square feet in the rotunda could be devoted to a striking exhibit of ceramic art, featuring art, craft, and machine production and animated by action exhibits of pottery making (varied processes) and glassmaking. Here should also be presented the basic story of earth and heat, that is, of the raw materials and the scientific principles on which the industry is based.

Hall of Glass

Branching from this Theme Exhibit would be the Hall of Glass with 3600 square feet to be given over to exhibits by glass companies. This entire space might be taken over by two or three companies or it could be divided into sections of 400 square feet each for nine companies, or smaller units, if that is desirable. Action could also characterize these exhibits because the industry operations have great appeal.

Hall of Pottery

Around the outer rim of the central hall are some 3500 square feet for individual pottery exhibits. At an average of 400 square feet each, this could accommodate nine exhibits.

Hall of Enameling

At the other main entrance to the building, the enameling branch could feature its industry story. A re-design of the original floor plan could provide for an importantly placed Theme Exhibit, of 1000 square feet, perhaps dramatizing the complete enameling process, with souvenir objects of the fine art quality being made. This would leave some 1500 square feet for individual exhibitors.

Portico

Because of the unusual design of this building, as much as 7000 additional square feet might be recovered for use by the industry, 5000 feet wall and floor space in a covered portico and 2000 extra feet made available by the coordinated use of the building. This portico fronts on one of the main avenues of the Fair and so affords one of the few outside exhibit areas of the Fair with exceptional circulation value. There is also an adjacent garden area.

Obviously, the covered portico and the garden offer exceptional opportunities for attractive exhibits by companies making tile, brick, art pottery, etc., in the shape of fountains, wall-pieces, floors, murals, doorways, walks, and art objects.

Importance of Exhibit

The building and courtyards of the Sèvres Building at the Paris Exposition set an all-time high for this type of presentation. It is to be hoped that a Ceramics Building at the New York World's Fair, conceived as a complete expression of this great, basic industry, could leave as powerful an impression on the fifty million visitors.

Financing

A program for financing this exhibit building must be discussed soon because the Fair can not hold this building open for more than a few weeks at the most.

Representatives of the Fair will be put at the disposal of the ceramic industry to discuss a financial program and the re-design of space and to coöperate in selling space.

CENTRAL DISTRICT ENAMELERS' CLUB

The Central District Enamelers' Club held a dinner meeting, May 26, 1938, at the Carter Hotel, Cleveland, Ohio. After the dinner, the following papers were presented:

(1) "Factors Affecting Rate of Nickel Deposition in Nickel Pickling," by J. M. ZANDER, chief chemist, Chicago Vitreous Enamel Product Co.

(2) "Processing of Acid-Resistant Enamels," by I. F. THOMPSON, manager, Service Dept., The O. Hommel Co.

(3) "Scratch Resistance of Sheet-Iron Cover-Coat Enamels," by J. B. SIMONDS, Westinghouse Electric & Mfg. Co.

GLASS INDUSTRY REVIEWED

The Presidential Address, "A Professor Looks Out on the Glass Industry," given by W. E. S. Turner before the Society of Glass Technology in November, 1937, has been printed on special paper and issued in book form. It is a masterly review of all technical progress in the glass industry during the past generation.

The price of the book is $2.75. Orders, with remittances, may be sent to the American treasurer of the Society of Glass Technology, F. C. Flint, Hazel-Atlas Glass Co., Zanesville, Ohio, or to the Society of Glass Technology, Darnall Road, Sheffield 9, England.

REVIEW OF ENGINEERING EDUCATION

Supported by a grant of $10,000 from the Carnegie Foundation for the Advancement of Teaching, the Engineers' Council for Professional Development has arranged for the preparation and publication of a Report on Engineering Education in 1937. This will be based on the great amount of information which has been gathered by the E.C.P.D. Committee on Engineering Schools in connection with its investigation for purposes of accrediting engineering curricula in degree-granting institutions of the United States.

It is expected that the Report on Engineering Education in 1937 will be ready for publication within a year, and copies will be distributed to important engineering libraries and officials of the engineering schools and engineering societies.

AMERICAN FOUNDRYMEN'S ASSOCIATION ISSUES EXHAUST CODE

The American Foundrymen's Association, 222 West Adams St., Chicago, Ill., announces a new code and handbook, developed by its Industrial Hygiene Codes Committee, entitled "Tentative Recommended Good Practice Code and Handbook on the Fundamentals of Design, Construction, Operation, and Maintenance of Exhaust Systems." The code contains 150 pages, is illustrated with 35 charts, and costs $4.00 a copy.

This is the third code of a series. The two codes previously issued are, "The Tentative Code of Recommended Practices for Grinding, Polishing, and Buffing Equipment Sanitation" and "Tentative Code for Recommended Practices for Testing and Measuring Air Flow in Exhaust Systems." Each of these codes has been issued in a second edition and is available at $1.00 a copy.

The new code gives complete engineering information which is essential in the proper design and construction of exhaust systems. The design and application of exhaust systems is an engineering problem and not one of rule-of-thumb methods.

The appendix gives an example of an exhaust system completely worked out, step by step, showing the proper use of all the rules and formulas given in the text.

Among some of the subjects of general information in the code are Theory of Air Flow in Exhaust Systems, Application of Exhaust Systems, Factors Affecting the Flow of Air in Exhaust Systems, Application of Collection Equipment, Air Flow Producing Equipment, Designing and Calculating an Exhaust System, Provisions for Makeup Air, General Construction Specifications, Industrial Vacuum Cleaning Equipment, and Operation, Supervision, and Maintenance of Exhaust Systems.

"JUST FOOLISHNESS"*

The United States contains 6% of the world's area and 7% of its population. It normally consumes 48% of the world's coffee, 53% of its tin, 56% of its rubber, 21% of its sugar, 72% of its silk, 36% of its coal, 42% of its pig iron, 47% of its copper, and 69% of its crude petroleum.

The United States operates 60% of the world's telephone and telegraph facilities, owns 80% of the motor-cars in use, and operates 33% of the railroads. It produces 70% of the oil, 60% of the wheat and cotton, 50% of the copper and pig iron, and 40% of the lead and coal output of the globe.

The United States possesses almost $11,000,000,000 in gold, or nearly half of the world's monetary metal. It has two-thirds of civilization's banking resources. The purchasing power of the population is greater than that of the 500,000,000 people in Europe and much larger than that of the more than a billion Asiatics.

Responsible leadership which can not translate such a bulging economy into assured prosperity is destitute of capacity. But pompous statesmen, looking over the estate, solemnly declare that the methods by which it was created are all wrong, ought to be abandoned, must be discarded, and that the time has come to substitute political management for individual initiative and supervision.

There's only one way to characterize that proposal—it is just damn foolishness.

* From *Sphere*, London, England.

Membership in
American Ceramic Society

FOR CONTINUING EDUCATION IN CERAMICS

H. M. WILLIAMS PRESIDENT OF AMERICAN SOCIETY OF REFRIGERATION ENGINEERS

Harry M. Williams, manager of the standards division of the Frigidaire Division, General Motors Corp., has been elected president of the American Society of Refrigeration Engineers at the annual meeting in New York City. Mr. Williams has been an active engineer and manufacturing executive for years. He has B.S. and M.S. degrees from Otterbein College and a Bachelor's degree in Chemical Engineering from Ohio State University.

H. M. Williams

His first engineering work was as engineer of tests for the National Cash Register Co., Dayton, Ohio, and the Remington Arms Union Metallic Cartridge Co., Bridgeport, Conn. He then was research chemical and metallurgical engineer for General Motors Research Corp., Dayton, becoming associated with Frigidaire when the research laboratories were moved to Detroit.

His work with Frigidaire has been as a chemical engineer, manager of the commercial refrigeration engineering division, and as manager of the standards division, the position he now holds.

He is chairman of the Technical Committee of the Refrigeration Division, National Electric Manufacturers' Association, and a member of the American Chemical Society, the British Institute of Metals, and the American Society for Testing Materials.

OUR SALUTE TO 1937–1938 ENAMEL DIVISION OFFICERS

Frank R. Porter, Chairman, Enamel Division, 1937–1938

Their Meeting in New Orleans was a record maker: a fine program and good attendance; congratulations to George Spencer-Strong and his co-workers.

APPLICATION FOR MEMBERSHIP IN THE INSTITUTE OF CERAMIC ENGINEERS

Write for your APPLICATION BLANKS if you are eligible for membership.

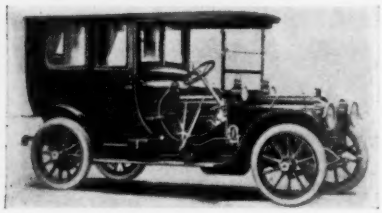
REQUIREMENTS

Members of the Society with (1) engineering degrees or (2) science degrees and experience in engineering work.

Write for APPLICATION BLANKS to

The American Ceramic Society, 2525 North High Street, Columbus, Ohio

Business vs. Government Costs*



1910 Four-Cylinder Packard
Limousine
$5,550

1937 Eight-Cylinder Packard
"120" Five-Passenger Sedan
$1,075 — 80.6%

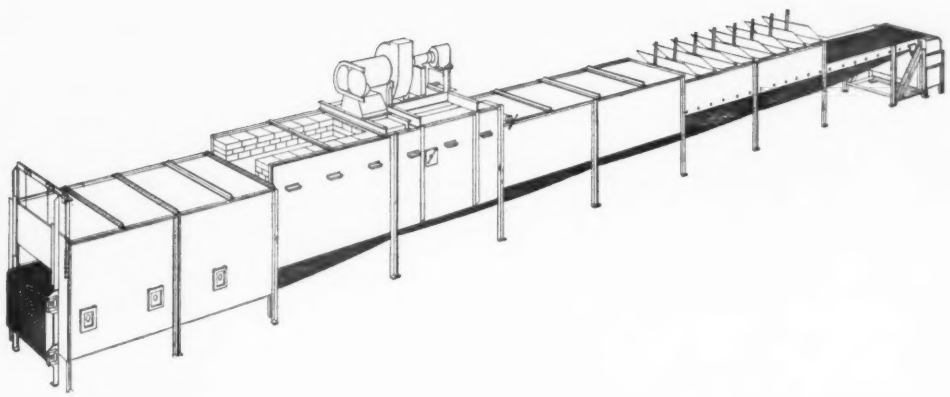
Federal Tax Payments by Michigan Taxpayers	1910	$5,361,998	+5,938%
	1937	$323,748,961	
Cost of Federal Government	1910	$693,617,000	+1,068%
	1937	$8,105,158,000	
Per Capita Cost of Federal Government	1910	$7.52	+ 735%
	1937	$62.69	
Public Debt of Federal Government	1910	$1,146,939,000	+3,075%
	1937	$36,424,613,000	
Per Capita Federal Debt	1910	$12.69	+2,120%
	1937	$281.63	

Which Needs Reforming—Business or Government?

WHAT DO THE OTHER 47 STATES PAY IN ABOVE TAXES?

Reprinted from the Detroit Board of Commerce weekly bulletin, February 28, 1938; acknowledgment is given to the Ferro Enamel Corporation, Cleveland, Ohio. The above was the cover for the April, 1938, issue of *The Enamelist*.

ANOTHER SIMPLEX SUCCESS



This is a line drawing of the New SIMPLEX Reddy Heat Unit Lehr that can do such a fine job of annealing for active manufacturers in the Glass Industry.

WHAT WILL IT DO FOR YOU?

It will give you ease of operation together with economy and make more saleable glassware for you.

ENOUGH? . . . . . ALMOST.

One Thing More . . . ITS COST IS REASONABLE

FRAZIER-SIMPLEX, INC.

ENGINEERS

436 East Beau Street Washington, Penna., U. S. A.

"CERAMIC" COLORS *For Satisfaction in Production*

COLORS

For Enamels:—Colors and Oxides; Smelter Oxides; Graining, Printing, Banding, and Screening Colors.

For Pottery:—Glaze and Body Stains; Underglaze and Overglaze Colors for Banding, Spraying, and Screening; Fritted Glazes and Fluxes.

For Glass:—Enamels; Vitrifiable Colors for Banding, Spraying, and Screening; Printing Colors; Fluxes; Batch Colors.

Decorating Supplies:—Printing Tissue; Screening Oils, French Fat Oil, Oil of Copaiba, Balsam Fir, Damar Varnish; Brushes; Knives and Spatulas; Grinding Mills.

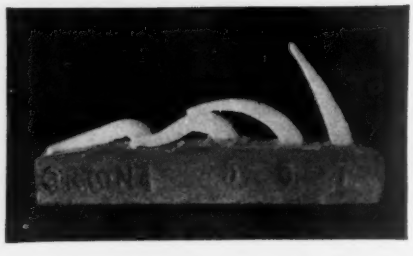
CHEMICALS

Aluminum Hydrate
Ammonium Carbonate
Antimony Oxide
Antimony, Black Needle
Barium Carbonate
Barium Chromate
Bone Ash
Cadmium Carbonate
Cadmium Oxide
Cadmium Sulphide
Calcspar
Chrome Oxide, Green
Clay, Vallendar
Cobalt Oxide, Black
Cobalt Sulphate
Copper Oxides
Iron Chromate
Iron Oxides
Kryolith
Lead Chromate
Magnesium Carbonate
Manganese Dioxide
Nickel Oxide, Black
Nickel Oxide, Gray
Nickel Sulphate
Potassium Bichromate
Potassium Nitrate
Potassium Permanganate
Powder Blue
Rutile, Powdered
Selenium
Sodium Aluminate
Sodium Antimonate
Sodium Bichromate
Sodium Silicate
Sodium Silico Fluoride
Sodium Uranate
Tin Oxide
Titanium Oxide
Uranium Oxide, Orange
Uranium Oxide, Yellow
Zirconium Oxide

"CERAMIC" COLORS

CERAMIC COLOR & CHEMICAL MFG. CO., NEW BRIGHTON, PENNA.

ORTON STANDARD PYROMETRIC CONES



For Forty-Two Years
The American Standard for
Control of Ceramic Heat Treatment

THE EDWARD ORTON, JR.,
CERAMIC FOUNDATION
George A. Bole, D.Sc., *Manager*

Laboratories & Office
1445 Summit Street—Columbus, Ohio

Advertise in The Bulletin

IT Goes to 2468 Subscribers

Number of Insertions

	1 month	*3 months*	*6 months*	*12 months*
Full page	$66.00	$60.00	$52.00	$44.00
Half page	36.00	33.00	30.00	26.00
Quarter page	20.00	18.00	16.50	15.00
Eighth page	10.75	9.90	9.00	8.25

Classified advertisements: 35 words for $1.10 per insertion

Cover positions: list plus 25%

First page preceding or following reading matter: list plus 20%

Color rates: on application

Reading notices not accepted

DeVILBISS

THE COMPLETE SPRAY-PAINTING AND FINISHING SYSTEM

Spray Guns—Material Containers—Regulators —Spray Booths—Exhaust Fans—Hose and Connections—Air Compressors—Accessories.

THE DeVILBISS COMPANY
TOLEDO, OHIO

U. S. Bureau of Mines Approval No. 2118. No. 200 for Type A Dusts.

GOGGLES . HELMETS
RESPIRATORS

Willson Protection guards ceramic workers against eye, nose, throat and lung hazards. The line includes U. S. Bureau of Mines Approved Respirators for Type A and Lead Dusts.

For Complete information write

DOUBLE WILLSON
PRODUCTS INCORPORATED
READING PENNSYLVANIA

ZIRCON

Because of a rapid decline in price and recent improvement in quality, Zircon is now exceedingly interesting to glass, enamel and porcelain manufacturers.

Send for Sample

FOOTE MINERAL CO.
1605 Summer St., Philadelphia, Pa.

MINING ZIRCON-BEARING BEACH SAND

CLAYS

English China and Ball

TALCS

for

HEATING ELEMENTS
CERAMIC BODIES
SAGGER USES

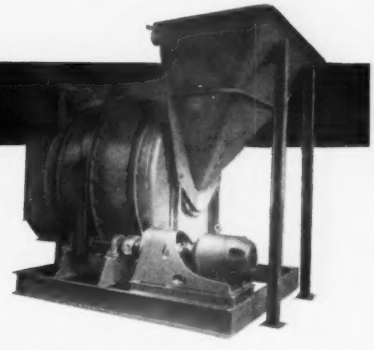
Ceramic Specialties Include

Whiting : Paris White : Magnesite
Cornwall Stone : Barium Carbonate
Zinc Oxide : Enameling Clays : Etc.

HAMMILL & GILLESPIE, INC.
Importers since 1848
225 Broadway New York

RANSOME
SOLE MAKERS OF AMERICA'S FIRST MIXER

MIXERS



DESIGNED FOR YOUR PARTICULAR NEED—

For mixing Glass batches, Enamel frits, Refractory plastic cements and other refractory material.

Take advantage of Ransome's 88 years' experience in solving your mixing problems.

Write for complete details

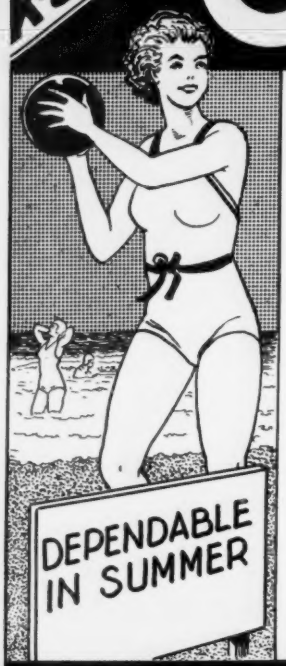
Industrial Division
RANSOME CONCRETE MACHINERY CO.
Dunellen New Jersey

Ransome
SINCE 1850
INDUSTRIAL MIXERS

K·C·M·Co.

CLAYS

BALL.....
SAGGER
WAD.....



During any WEATHER
we can ship Promptly
UNIFORM, STANDARDIZED CLAYS
with no EXCESSIVE MOISTURE.

Ask us for Samples

KENTUCKY CLAY MINING
COMPANY, INC.
MAYFIELD, KENTUCKY

McDANEL REFRACTORY PORCELAIN COMPANY

Manufacturers of

PORCELAIN TUBES PROTECTION TUBES
INSULATING TUBING and BEADS

BEAVER FALLS PENNSYLVANIA

All Types of Circular and Straight Tunnel Kilns

SWINDELL-DRESSLER CORPORATION

Post Office Box 1888 **Pittsburgh, Pa.**

Lehrs and Enameling Furnaces, Electric and Gas Fired

Full Details Furnished on Request

BORAX *Guaranteed 99½%–100% Pure* **BORIC ACID**

Select the Brand which has back of it years of *successful use* by experienced Ceramists

Pacific Coast Borax Co., New York

Chicago 20 Los Angeles

PRODUCTS
of Proven Merit
— SINCE 1909 —

THERE is satisfaction in knowing that the colors you buy for your products are of finest quality and consistently dependable.

When you buy Vitro Colors, Opacifiers and Chemicals you buy products of merit.

✦ ✦ ✦

Opacifiers and Oxides for Enamels
Acid and Sulphide Resisting Glass Colors
Modern Glaze Stains and Overglazes
Chemicals for Ceramic Use

THE VITRO MFG. CO.
Corliss Station, Pittsburgh, Pa.

California Branch:
16 California St.,
San Francisco

VITRO PRODUCTS

FIREPROOF ELECTRICAL INSULATION WITHOUT KILN FIRING

Mr. Ceramist, what do you know about Electrical Resistivity at "Elevated Temperatures"?

If you are interested in trying to secure the best fireproof electrical insulation (aside from fired porcelain), you will secure ideal results beyond your expectations with

SAUEREISEN PLASTIC PORCELAIN No. 30

Used on leading Electrical roasters, waffle irons, soldering irons, surgical instruments, receptacles, transformers, terminals, etc.

Sets cold without Silicate of Soda or organic binders, Does not injure resistance wire.

JUST SAY: Ship us a Trial Gallon of Sauereisen No. 30 at $2.50
100-lb. 18¢....500-lb. 16¢....2000-lb. 13¢

SAUEREISEN CEMENTS COMPANY
Makers of Acidproof, Insulating and Assembling Cements

2168 Sharpsburg St.
PITTSBURGH (15), PA.

HARTFORD-EMPIRE COMPANY
HARTFORD, CONN.

Engineers and Licensors

FEEDERS FORMING MACHINES CONVEYORS
STACKERS LEHRS

OFFICIAL AMERICAN CERAMIC SOCIETY EMBLEM

10 K. Solid Gold—$6.50
20 Year Gold Filled—$3.25

Order directly from the

AMERICAN CERAMIC SOCIETY
2525 N. High St., Columbus, Ohio

Be sure to enclose check or money order for full amount

THE MARK OF QUALITY

THE WORLD'S PEMCO FINEST

THE PORCELAIN ENAMEL & MFG. CO.
PEMCO and EASTERN AVES., BALTIMORE, MD.

Tunnel, Truck and Humidity Dryers for—
Dry Pressed Electrical Porcelain
High Voltage Electrical Porcelain
Sanitary Porcelain
Floor and Wall Tile
Abrasive Wheels
Glass Pots and Blocks
Refractory Brick and Shape
Also Stove Rooms and Mangles for General Dinnerware

PROCTOR & SCHWARTZ, INC.
The Largest Builders of Drying Machinery for Industry
Seventh Street & Tabor Road, Philadelphia, Pa.

BETHLEHEM PRODUCTS
for the Ceramic Industry
88-80 CASTINGS
to save maintenance on grinding equipment
BETHLEHEM ABRASIVE-RESISTING PLATES
for chutes, hoppers, dump-car bottoms
BETHLEHEM TOOL STEEL
for dry press and repress liners
WIRE ROPE
for all excavating and material-handling equipment
Also—Light Rails, Steel Ties and Track Equipment;

BETHLEHEM STEEL COMPANY
General Offices BETHLEHEM STEEL **Bethlehem, Pa.**
District Offices: Albany, Atlanta, Baltimore, Boston, Buffalo, Chicago, Cincinnati, Cleveland, Columbus, Dallas, Detroit, Honolulu, Houston, Indianapolis, Johnstown, Pa., Kansas City, Los Angeles, Milwaukee, Nashville, New Haven, New York, Philadelphia, Pittsburgh, Portland, Ore., Salt Lake City, San Antonio, San Francisco, St. Louis, St. Paul, Seattle, Syracuse, Toledo, Tulsa, Washington, Wilkes-Barre, York.
Export Distributor: Bethlehem Steel Export Corporation, New York

THE SHARP-SCHURTZ COMPANY
CHEMISTS FOR THE CERAMIC INDUSTRY
WE HAVE FULLY EQUIPPED LABORATORIES AT
LANCASTER, OHIO U. S. A.

EMERSON P. POSTE
CONSULTING CHEMICAL ENGINEER
ANALYSES: CERAMIC RAW MATERIALS AND PRODUCTS, FUELS, IRON AND STEEL, ETC.
SPECIAL INVESTIGATIONS: PHYSICAL AND CHEMICAL TESTS ON ENAMEL, ETC.
309 McCALLIE AVE.,
CHATTANOOGA, TENN.

BACK NUMBERS
OF
JOURNAL OF AMERICAN CERAMIC SOCIETY
AND ALL IMPORTANT MAGAZINES FROM THE WORLD OVER
We furnish single copies, volumes and sets or photostat reproductions of specific sections, reasonably and promptly
WRITE, PHONE OR WIRE PERIODICALS DEPARTMENT
THE H. W. WILSON COMPANY 950 University Avenue, New York

PURE WYOMING BENTONITE

(Colloidal Clay)

An ideal medium of high absorption properties, used to increase plasticity of low plastic or non-plastic minerals or clays—also excellent for use in preparing suspensions, emulsions and for the addition of bond.

THE WYODAK CHEMICAL COMPANY

4600 E. 71st St. Cleveland, Ohio

Branches—New York—Detroit—Chicago—Los Angeles—Richmond, Va. Mines—Upton, Wyo.

HIGH GRADE CLAYS

FOR EVERY CERAMIC NEED

UNITED CLAY MINES CORPORATION

GENERAL OFFICES TRENTON, NEW JERSEY

THREE ELEPHANT BORAX

REG. U.S. PAT. OFF. REG. U.S. PAT. OFF.

AND BORIC ACID

GUARANTEED OVER 99.5% PURE

AMERICAN POTASH & CHEMICAL CORPORATION

70 Pine Street, New York

FLINT

PAPER MAKERS IMPORTING CO. INC. EASTON, PENNSYLVANIA, U.S.A. PMC INC.

FINEST POTTERY CLAYS

TALC WHITING

THE HOUSE OF HOMMEL
SUPPLIERS OF ALL CERAMIC NEEDS

Quality
FRITS
COLORS
CHEMICALS
Stocked for
IMMEDIATE SHIPMENT

THE
O. HOMMEL CO.
Quality First - Since 1891
209 Fourth Avenue Pittsburgh, Pa.
LET OTHERS IMITATE -:- WE ORIGINATE

Pacific Coast Agents
L. H. BUTCHER CO.
Los Angeles - Salt Lake City - San Francisco - Portland - Seattle

SOLVAY
TRADE MARK REG. U. S. PAT. OFF.
dustless dense
SODA ASH

Made Especially for the Glass Maker

Specify SOLVAY when you buy Soda Ash because Solvay is and has been the standard of quality since 1881. It offers the following advantages:

1. More than 99.50% Sodium Carbonate (dry basis).
2. Proper granulation and absolute uniformity in quality.
3. Your choice of Soda Ash graded for efficient use with any of the known commercial glass sand.
4. The services of a well organized technical staff which is available to Solvay customers.

Make Solvay your source of supply for
DUSTLESS CALCINED 98-100%
POTASSIUM CARBONATE
Hydrated 83-85% Potassium Carbonate
Ground Caustic Potash

Full information sent on request.
SOLVAY SALES CORPORATION
Alkalies and Chemical Products Manufactured by The Solvay Process Company
40 RECTOR ST. NEW YORK

Ceramic Service? We Give It

We Manufacture—

Pins—all shapes and lengths
Stilts
Thimbles
Spurs
Saggers
Crucibles
Tile for Decorating Kilns

We Sell—

Ball Clays—Kentucky
Sagger Clays—Kentucky
Ground Fire Clay—Ohio, Pennsylvania
Bitstone—all sizes
Fire Brick
Imported Paris White
Domestic Whiting
Georgia Kaolin
Modeling Clay

THE POTTERS SUPPLY COMPANY
EAST LIVERPOOL, OHIO

Du Pont Ceramic

RESEARCH

Creates a

NEW LIQUID BRIGHT GOLD

with Improved Color, Greater Coverage and Wide Firing Range

It's absolutely new—a product of extensive research—designed to meet the present day demands for effective and economical decoration. Here are some of its advantages:

Improved Color—A genuine "gold" color without overtones.

Greater Coverage—More decorated ware per bottle because of the freer flow, more even coverage and the right drying rate for speedy decoration. All the gold is used up from the tile. No "stiff" gold.

Wide Firing Range—The gold adheres at relatively low temperatures, withstands firing at the higher temperatures required to mature any decalcomania colors on the ware. This feature decreases and in many cases removes the need for re-decorating and re-finishing.

Uniformity, lot to lot, because the new Bright Gold is made by scientifically controlled methods from standardized materials of definite composition.

The new du Pont Liquid Bright Gold has received thorough commercial tests and is now being used by leading pottery and glass manufacturers. A trial in your own plant on your own ware will prove its decided superiority and economy.

Write for samples and more information.

DU PONT
REG. U. S. PAT. OFF.

The R. & H. Chemicals Department
E. I. DU PONT DE NEMOURS & COMPANY, INC.
Wilmington, Delaware

District Sales Offices: Baltimore, Boston, Charlotte, Chicago, Cleveland, Kansas City, Newark, New York, Philadelphia, Pittsburgh, San Francisco

Forty-First Annual Meeting

AMERICAN CERAMIC SOCIETY

Hotel Stevens, Chicago, Illinois

Week of April 16, 1939

Eight Divisions Meeting Simultaneously

COMING TOGETHER *plus*
KEEPING TOGETHER *plus*
WORKING TOGETHER *makes for*

Progress for Individuals, Industries and States

Thus Civilization Was Started and
Thus It Is Perpetuated

Meetings of this Society make for Advances in Ceramics

H. C. SPINKS CLAY COMPANY

Miners and Shippers of

BALL, SAGGER AND WAD CLAY

NEWPORT, KY.

Trenton, New Jersey
May 26, 1938

Mr. Pete Potter,
Comfortable Sanitary Pottery Mfg. Co.
Pottsville, Ohio

Dear Pete:

Having a nice trip here in the East. Business over here seems to be gradually but surely improving. I guess it's more luck than management, but anyhow our business is good. SPINKS CLAYS are continually gaining new friends and accounts and staying there.

Say, I stopped in Washington. Someday we may get tariff protection under this so called Democratic regime. Right now Congress seems willing to go home if they can just put over one more big experiment, so looks like we get the Wage & Hour Bill.

Will be down at the mines all this summer, so come see us dig it.

Sincerely,

Dick Carothers

General Manager
H. C. SPINKS CLAY COMPANY

Prove the superior quality of

M and T

SODIUM ANTIMONATE

Every lot of M and T sodium antimonate must pass eleven exacting physical, chemical, and enameling tests before it is shipped from the factory.

These tests prove the absolute uniformity of both the product and its performance. They prove that M and T sodium antimonate is entirely free from chemical or physical variations—that it is always of the highest quality which selected raw materials, scientifically processed, can produce.

The many users of M and T sodium antimonate take no chances when they continually choose this superior product.

METAL & THERMIT CORPORATION, 120 BROADWAY, NEW YORK, N. Y.